

PRELIMINARY ASSESSMENT

**Durango Lead Smelter
Durango, Colorado**

CERCLIS ID #CO0001399633

**EPA Contract No. 68-W5-0031
TDD No. 9602-0001**

**Prepared By:
Rachel Badger
Environmental Scientist**

**URS Operating Services, Inc.
1099 18th Street, Suite 710
Denver, CO 80202-1908**

SDMS Document ID



450484

403134

450484

Approved:

T. F. Staible
T. F. Staible, START Team Leader, UOS

Date:

4/1/96

Approved:

Rachel S. Badger
Rachel Badger, Environmental Scientist, UOS

Date:

4/1/96

Approved:

Pat Smith
Pat Smith, Site Assessment Manager, EPA, Region VIII

Date:

4/2/96

This document has been prepared for the U.S. Environmental Protection Agency under Contract No. 68-W5-0031. The material contained herein is not to be disclosed to, discussed with, or made available to any person or persons for any reason without prior express approval of a responsible officer of the U.S. Environmental Protection Agency. In the interest of conserving natural resources, this document is printed on recycled paper and double-sided as appropriate.

URS Operating Services, Inc.
START, EPA Region VIII
Contract No. 68-W5-0031

Durango Lead Smelter - PA
Distribution List
Revision: 1
Date: 04/1996
Page ii of iv

DISTRIBUTION LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY

Pat Smith Site Assessment Manager, START, EPA Region VIII

URS OPERATING SERVICES, INC.

Rachel Badger Environmental Scientist, START, EPA Region VIII
File (2 copies) START, EPA Region VIII

**PRELIMINARY ASSESSMENT
Durango Lead Smelter
Durango, Colorado**

TABLE OF CONTENTS

| | <u>PAGE #</u> |
|---|----------------------|
| SIGNATURE PAGE | i |
| DISTRIBUTION LIST | ii |
| TABLE OF CONTENTS | iii |
| 1.0 INTRODUCTION | 1 |
| 2.0 OBJECTIVES | 1 |
| 3.0 SITE DESCRIPTION | 1 |
| 3.1 Site Location | |
| 3.2 Site History and Previous Work | |
| 3.3 Site Characteristics | |
| 3.3.1 Physical Geography | |
| 3.3.2 Geology | |
| 3.3.3 Hydrogeology | |
| 3.3.4 Hydrology | |
| 3.3.5 Meteorology | |
| 4.0 PRELIMINARY PATHWAY ANALYSIS | 5 |
| 4.1 Waste Characterization | |
| 4.2 Air Pathway | |
| 4.3 Groundwater Pathway | |
| 4.4 Surface Water Pathway | |
| 4.5 Soil Exposure Pathway | |
| 5.0 SUMMARY | 10 |
| 6.0 LIST OF REFERENCES | 11 |

FIGURES

- Figure 1 Area of Influence Map
Figure 2 Site Map

75.60201.00
\\START\\Durango\\Final-Pb.PA\\Rev-1\\Durango.Txt:rsb:bas:jmb

TABLE OF CONTENTS (continued)

TABLES

| | |
|---------|--|
| Table 1 | DOE Slag Samples, Total Metals |
| Table 2 | DOE Slag Samples, EP Toxicity Metals |
| Table 3 | Groundwater Summary Tables |
| Table 4 | Bureau of Reclamation Groundwater Summary Tables |

APPENDICES

| | |
|------------|------------------------------|
| Appendix A | PA Report Form 2050-0095 |
| Appendix B | PA Worksheet |
| Appendix C | CERCLA Eligibility Worksheet |
| Appendix D | Site Reconnaissance Form |
| Appendix E | Site Photolog |

1.0 INTRODUCTION

This Preliminary Assessment (PA) of the Durango Lead Smelter site (CERCLIS ID# CO0001399633) in Durango, La Plata County, Colorado, has been prepared to satisfy the requirements of Technical Direction Document (TDD) No. 9602-01 issued to URS Operating Services, Inc. (UOS) by the Region VIII office of the U.S. Environmental Protection Agency (EPA). A site reconnaissance was conducted by UOS personnel on February 20 and 21, 1996. This PA report is the result of observations made during the site reconnaissance and information obtained from historical records, federal and state agencies, and personal interviews.

2.0 OBJECTIVES

The objectives of this PA are to:

- Determine contaminant characteristics and quantify waste sources;
- Report on the adequacy of containment of waste sources;
- Assess potential routes for contaminant migration;
- Identify local receptor targets potentially at risk from contaminant migration; and
- Determine the potential impacts to public health and the environment.

3.0 SITE DESCRIPTION

3.1 SITE LOCATION

The Durango Lead Smelter site is located in the southeast quarter of Section 30, T. 35 N., R. 9 W., of the Durango West Quadrangle, La Plata County, Colorado (U.S. Geological Survey (USGS) 1963b). The site is located southwest of Durango, along the west bank of the Animas River (Figure 2). The approximate site coordinates are 37° 16' 03.00" N. latitude and 107° 53' 00.00" W. longitude.

3.2 SITE HISTORY AND PREVIOUS WORK

The Durango Lead Smelter site history extends from 1882 through approximately 1935. The San Juan Smelting and Mining Company, originally from Silverton, Colorado, began operation in 1882. In 1887, it was reported that the San Juan Company smelted over \$1 million worth of silver, lead, gold, and copper, and was the ninth ranked smelter in Colorado and the largest in the San Juans. At the turn of the century, all the major smelting corporations in Durango merged to become the American Smelting and Refining Company at this location. The American Company closed in the mid 1930s and was dismantled in approximately 1942 (Smith 1980).

Another smelting company operated approximately three-quarters of a mile downstream of the lead smelter site (Figure 2). The Standard Smelting Company operated from 1892 through approximately 1911 (Smith 1980). This site is undergoing a preliminary assessment and site investigation by UOS for the EPA under TDD 9602-0007, the Durango Copper Smelter, CERCLIS ID# CO0001399930, concurrent with the Durango Lead Smelter.

The United States Vanadium Corporation built a uranium processing mill at the site of the lead smelter site in 1942. The uranium mill operation and the associated tailings at this location were the focus of a U.S. Department of Energy (DOE) Uranium Mill Tailings Remedial Action (UMTRA) that was conducted to clean up the uranium mill tailings deposited along the Animas River. During the removal of those tailings (from 1986 to 1991), the DOE also removed the remaining lead smelter stack, building materials and rubble associated with the former lead smelter. The slag from the smelter operation was left at the site because it was not within the scope of responsibility of the DOE under the UMTRA project. The slag was graded and the site area was covered with clean backfill and topsoil and vegetated. The west bank of the Animas River was riprapped to minimize erosion (U.S. Department of Energy (DOE) 1995).

3.3 SITE CHARACTERISTICS

3.3.1 Physical Geography

The Durango Lead Smelter site is located along the west bank of the Animas River. The site is located approximately 6,520 feet above mean sea level in La Plata County (USGS 1963a). The Durango Lead Smelter site is approximately 15 acres in size, or 653,400 square feet (DOE 1995; URS Operating Services, Inc. (UOS) 1996). Site topography is generally flat, with a slight southeastward slope for drainage toward the Animas River. The slag was graded during the UMTRA project before backfill was brought in Colorado Department of Public Health and the Environment (CDPHE) 1996; UOS 1996). The site area is situated in a transitional area of the Southern Rocky Mountain Physiographic Province and the Colorado Plateau Province (Bureau of Reclamation (BOR) 1981).

3.3.2 Geology

The former lead smelter area is underlain by dark gray to black Mancos Shale which is more than 1,700 feet thick. The Mancos Shale is truncated by the Smelter Mountain fault south of the site area. The Point Lookout Sandstone and the Menefee Formations outcrop south of the site area and south of the Smelter Mountain fault. At the site area along the base of Smelter Mountain, the Mancos Shale is directly overlain by up to a 25 feet thick layer of colluvium. The colluvium consists of poorly sorted, silty soil from Smelter Mountain. Along Lightner Creek and the Animas River, deposits of river-laid sand and gravel up to 15 feet thick occur over the shale bedrock and under the colluvium (DOE 1995).

3.3.3 Hydrogeology

Hydrostratigraphic units at the lead smelter site include the consolidated bedrock unit overlain by unconsolidated surficial deposits. Together the surficial hydrostratigraphic units (alluvium and colluvium) and the bedrock unit (the uppermost few feet of weathered, fractured Mancos Shale) directly under the surficial deposits comprise the

uppermost aquifer in the site area. Groundwater occurs in a shallow alluvial aquifer overlying bedrock at the former lead smelter site. Groundwater at the site moves predominantly through the alluvium overlying the low-permeability Mancos Shale bedrock and discharges into the Animas River to the east (DOE 1995).

In gravels above the bedrock, the hydraulic conductivity is estimated to be 7×10^{-3} centimeters per second (cm/sec). In the colluvium near the base of Smelter Mountain, recharge is primarily by runoff from the mountain and by infiltrating precipitation. Sand and gravel deposits receive recharge from Lightner Creek and the Animas River (DOE 1995).

3.3.4 Hydrology

Site topography indicates that surface water drainage via overland flow is directed to the south and east towards the Animas River (USGS 1963b). The annual mean discharge rate of the Animas River at Durango is 822 cubic feet per second (cfs); the highest annual mean discharge rate is 1,366 cfs (water years 1898-1994). The discharge rate is recorded at the USGS Durango gauging station approximately one mile upstream of the site (USGS 1994). Upstream of the site area, the Animas River has a drainage area of approximately 770 square miles (DOE 1995). The site lies within the Animas River 100-year flood plain (BOR 1981).

3.3.5 Meteorology

The Durango Lead Smelter site is located in a semiarid climate zone. The mean annual precipitation as totaled from the University of Delaware (UD) database is 12.83 inches. The net annual precipitation as calculated from precipitation and evapotranspiration data obtained from the UD database is 1.61 inches (University of Delaware, Center for Climate Research, Department of Geography 1986). The 2-year, 24-hour rainfall event for this area is 1.5 inches (Dunne and Leopold 1978).

4.0 PRELIMINARY PATHWAY ANALYSIS

4.1 WASTE CHARACTERIZATION

The buried lead slag that remains along the west bank of the Animas River is approximately 25 feet thick and covers approximately 15 acres (DOE 1995; UOS 1996). The volume of lead slag has been estimated at approximately 200,000 cubic yards of material. As a part of the DOE UMTRA, the slag was graded and covered by a minimum of approximately 18 to 24 inches of clean backfill and approximately 6 inches of topsoil. The area was vegetated with indigenous plant species (DOE 1995). Building material, rubble and bricks, and the smelter stack were removed as a part of the UMTRA by the DOE to the Bodo Canyon disposal site, approximately 1.5 miles to the southwest of the site in a mountain valley near Bodo Canyon. During the UMTRA removal the DOE sampled the bricks from the old smelter stack. The DOE indicated the presence of Ra-226 concentrations in the brick material (MK-Ferguson Company 1995). However, during the UOS site reconnaissance, foundation material, rusted metal beams, and old bricks were noted along the west bank of the Animas River where slag outcrops were identified (Photos 1 and 2) (UOS 1996). The raffinate ponds shown on Figure 2 were associated with the DOE UMTRA project and are approximately 3,000 feet downstream of the lead smelter site. Raffinate, the waste solution produced from the uranium-vanadium recovery process, was stored in evaporation ponds. Contaminated soils from these ponds were removed and relocated by the DOE during the remedial action (DOE 1995).

In 1989, 11 slag samples were collected by MK-Ferguson Company and sent to Analytica Labs in Albuquerque, New Mexico, for EP Toxicity and Total Metals analysis. The slag samples were collected from the existing slag (a by-product of the lead smelter operation) at the location that was reclaimed under the UMTRA project. The slag material was not the responsibility of the DOE under the UMTRA Project so the slag material was left during the reclamation of the UMTRA site (DOE 1989).

Surface samples and composite samples (up to 12 feet below ground surface (bgs)) were randomly collected through visual identification of different slag types. Samples were analyzed according to EPA protocols published in SW-846 Test Methods for Evaluating Solid Waste, Third Edition,

1986. Table 1, DOE Slag Samples, Total Metals and Table 2, DOE Slag Samples, EP Toxicity metals display the results of the analysis (DOE 1989). Review of the total metals data indicates that the following analytes are above the ranges and/or averages for element concentrations in soils in the conterminous United States (the highest concentration of the analyte is noted in parentheses): antimony (70 ppm), arsenic (480 ppm), barium (8,100 ppm), cobalt (160 ppm), copper (5,400 ppm), lead (25,000 ppm), mercury (0.5 ppm), molybdenum (150 ppm), uranium (233 ppm), vanadium (910 ppm) (DOE 1989; USGS 1984). Five samples indicated concentrations of lead (EP toxicity extract) that exceeded the EP Toxicity maximum concentration action level of 5 ppm (highest concentration at 58 ppm) (DOE 1989).

4.2 AIR PATHWAY

Waste slag from the former smelter operation was buried on site during the DOE UMTRA project. Slag outcroppings were observed during the UOS site reconnaissance (Photo 3) (UOS 1996). If contaminants migrated through the air pathway, proximal targets include the total population of City of Durango, 12,430 people, which is situated within four miles of the site (U.S. Department of Commerce (USDOC) 1990). The nearest residences (approximately five houses) are located on the east bank of the Animas River, approximately one-quarter of a mile to the east of the site. The site area has been backfilled with a minimum of between 18 to 24 inches of clean backfill and another 6 inches of topsoil, and vegetated by the DOE during the UMTRA (CDPHE 1996). The prevailing wind direction is west-northwest down the river valley (DOE 1995). There are no U.S. Department of the Interior National Wetland Inventory (NWI) maps available for the Durango area. Emergent riverine wetland growth was identified during the site reconnaissance along the 15-mile downstream target distance limit; however, the site visit was conducted outside the growing season so the cumulative wetland population could not be identified (UOS 1996).

Additional targets within the air pathway include federally-listed threatened or endangered species present in La Plata County, or the county is in the species' historical range. These species include the American Peregrine Falcon (endangered), Bald Eagle (threatened), Eskimo Curlew (endangered), and the Southwestern Willow Flycatcher (endangered). Critical habitat for the Mexican Spotted Owl (threatened) occurs in La Plata County (U.S. Fish and Wildlife Service

(USFWS) 1996). A state listing of threatened or endangered species was not yet available at the time this report was generated.

4.3 GROUNDWATER PATHWAY

Wastes may migrate to the alluvial and bedrock aquifers if they are leaching into groundwater. The DOE has documented 20 wells within a two-mile radius of the site, which would serve approximately 47 people based on 2.35 persons per household in Durango (DOE 1995; USDOC 1990). The Colorado State Engineers Office has records of 90 household use only well permits (which would serve approximately 211 people) completed to the alluvium and bedrock within two to four miles of the site (State Engineer's Office 1996; USDOC 1990). However, the city of Durango is supplied by municipal water from the Florida and Animas Rivers (Durango Public Works 1996). Development and utility policies for the city of Durango prohibit the drilling of private wells within the city limits.

The DOE collected groundwater quality data for the UMTRA uranium mill tailings site area and vicinity from 1982 through 1989 and again from 1990 through 1994. Four of the groundwater samples taken from DOE monitoring wells, shown on Figure 2, are used in this investigation because of their proximity to the Lead Smelter site. Samples, both filtered and unfiltered, were analyzed for selected inorganics and four radionuclides. Background well identification numbers are DUR-01-629 and DUR-01-658. Downgradient well identification numbers, DUR-01-612 and DUR-01-617, indicate groundwater contamination (Figure 2). The data for these wells are shown on Table 3 as it was presented in the DOE "Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Durango, Colorado" (DOE 1995). The DOE speculates in this report that contamination related to uranium mill processing has been slowly moving downgradient in two primary plumes, one associated with each of the former tailings piles. It was noted that contamination is increasing in monitoring well DUR-01-617 and decreasing in monitoring well DUR-01-612. The plumes are speculated to be migrating past these monitoring wells toward the Animas River (DOE 1995).

The Bureau of Reclamation (BOR) collected aqueous samples from groundwater wells approximately 3,000 feet south of the Lead Smelter site from 1990 through 1992. The BOR data

is included in Table 4, Bureau of Reclamation Groundwater Summary Tables. Samples were analyzed for total metals. The BOR speculates in their report, "Hydrogeochemical site characterization," that groundwater downgradient from the raffinate ponds area (south of the Lead Smelter site) has shown a trend toward declining arsenic and cadmium concentrations. Selenium concentrations have been detected above the Maximum Contaminant Level (MCL) in both background and downgradient monitoring wells (BOR 1990).

4.4 SURFACE WATER PATHWAY

Municipal drinking water for the city of Durango is supplied from surface water which is collected from the Florida and Animas Rivers and then is mixed and supplied to the entire population of Durango. The main surface water intake for the municipal supply is located along the Florida River, a separate watershed from the Animas River which flows to the south approximately five miles to the east of the site (Figure 1). The municipal surface water intake on the Animas River, at 29th Street in Durango, is located approximately two miles upstream of the site (Figure 1). Water from the Animas River is used primarily when there is a high demand on the municipal water supply, generally during the summer months (Durango Public Works 1996).

The Durango Lead Smelter site is located on the west banks of the Animas River. Contaminants from the buried slag could potentially migrate to the surface water pathway where slag is exposed at the river bank and where slag is exposed in drainages leading to the Animas River (UOS 1996a).

The Animas River is a recreational fishery (Colorado Division of Wildlife (CDOW) 1996). The Colorado Department of Wildlife stocks the Animas River with Brown Trout, Rainbow Trout, and Cutthroat Trout. Native species in the Animas River include the Blue Head Sucker (which is most abundant), Flannel Mouth Sucker, Mottled Sculpin, and Speckled Dace. Occasionally the non-native White Sucker is identified in the Animas. The stretch of the Animas from Lightner Creek (one mile north of the site area) to Purple Cliffs (approximately two and one-half miles downstream of the Durango Lead Smelter site) was used by approximately 6,200 fisherpersons from April 1990 through August 1990. The fishing limit is two fish, 16 inches or longer (artificial flies and lures only). The catch rate on this stretch of the Animas is 0.75 fish per hour or 1.2 fish

per fisher per trip, or approximately 3,000 pounds per year (based on an estimate of 0.4 pounds per fish greater than or equal to a 16-inch fish) (CDOW 1996).

The Animas River, a recreational water body, is used as a kayak course adjacent to the site area (UOS 1996a). There are no private drinking water intakes identified along the Animas River downstream of the site (Durango Public Works 1996). There are no NWI maps for the Durango area; however, there were riverine wetlands identified during site reconnaissance activities on February 20 and 21, 1996, by UOS personnel (UOS 1996a).

Aqueous samples collected for the Durango Landfill, Site Inspection Prioritization conducted for the EPA in 1995 by Morrison Knudsen Corporation indicate that lead is detected at 75.2 parts per billion (ppb), which is over the Ambient Water Quality Criteria (AWQC) action level (3.2 ppb) established by the EPA. This sample, collected approximately 1.25 miles downstream of the Durango Copper Smelter site, was used to establish background conditions for the Durango Landfill site, hence, no upgradient sample was collected for comparison (Figure 1) (EPA 1995a; EPA 1995b).

Surface water and sediment samples were collected by the DOE along the Animas River for the UMTRA project. Samples were collected in November 1993, after DOE UMTRA Project reclamation. Sample locations are displayed on Figure 2. Samples were analyzed for all inorganics (DOE 1995).

Analytical data collected by the DOE and BOR does not meet specific data quality objectives for the HRS. Detection limits (DL) for methods used are above specific guidelines for the affected targets of the surface water pathway, hence resampling during the Site Inspection with lower DLs and stricter QA/QC is necessary for evaluation under the HRS. The DOE and BOR data was compared to applicable guidelines for targets potentially affected. Targets associated with the Animas River are the fishery and wetlands. Applicable guidelines for the surface water pathway are as follows: Reference Dose/Screening Concentration (RD/SC); Cancer Risk/Screening Concentration (CR/SC); Ambient Water Quality Criteria (AWQC); and if no other guideline was available, the Maximum Contaminant Level (MCL) was used from the drinking water guidelines (Office of the Federal Register 1990).

- The DOE aqueous data indicate that the following analyte DLs were used: antimony (DL of 3 - 10 ppb / RD/SC of 0.52 ppb), beryllium (DL of 5 - 10 ppb / CR/SC of 0.73 ppb), cadmium (DL of 1 - 2 ppb / AWQC of 1.1 ppb), copper (DL of 10 - 20 ppb / AWQC of 12 ppb), cyanide (DL of 10 ppb / AWQC of 5.2 ppb), mercury (DL of 0.2 ppb / AWQC of 0.012 ppb), selenium (DL of 5 ppb / AWQC of 5 ppb), silver (DL of 10 ppb / AWQC of 2.3 ppb), and thallium (DL of 10 - 30 ppb / MCL of 0.5 ppb) (EPA 1995b; DOE 1995).
- The BOR aqueous data indicate that the following analyte DLs were used: arsenic (DL of 0.5 - 2.0 ppb / CR/SC of 0.74 ppb), cadmium (DL of 0.5 - 5.0 ppb / AWQC of 1.1 ppb), copper (DL of 10 - 200 ppb / AWQC of 12 ppb), and lead (DL of 5.0 - 20 ppb / AWQC of 3.2 ppb) (EPA 1995b; BOR 1990).

4.5 SOIL EXPOSURE PATHWAY

The Durango Lead Smelter site is owned by the State of Colorado. The UMTRA clean-up was conducted by the DOE. The source area (lead slag) has been covered with a minimum of 18 to 24 inches of backfill and another 6 inches of topsoil during the UMTRA. Slag outcroppings were identified during the UOS site reconnaissance along the west bank of the Animas River (Photo 3) (UOS 1996). Currently, the State of Colorado plans on selling the southern portion of the site (the location of the raffinate ponds) to the Bureau of Reclamation for the installation of a pumping plant as a part of the Animas/La Plata Wastewater Management Plan. The northern portion of the property (the former location of the uranium mill tailings and current location of buried lead smelter slag) is slated for purchase by the city of Durango (CDPHE 1996).

Access to the site is restricted by fencing and locking gates (UOS 1996). Approximately 4,143 people reside within one mile of the site (USDOC 1990). Other potential targets include federally-listed threatened or endangered species present in La Plata County or the county is in the species' historical range. These species include the Black-footed Ferret (endangered) and the Knowlton's Cactus (endangered) (USFWS 1996).

5.0 SUMMARY

The Durango Lead Smelter operated from 1882 through approximately 1935. The site is located along the west bank of the Animas River and covers approximately 15 acres. The slag, a by-product of the smelting operation, was left after a DOE UMTRA cleanup of uranium tailings that formerly existed at the site location. After the removal of the UMTRA tailings, the slag was graded, covered with clean backfill and topsoil, and vegetated. The west bank of the Animas River was riprapped to prevent erosion. However, the bank continues to erode and slag material has been exposed and observed to be sloughing into the Animas River.

Proximal targets related to the Lead Smelter site include the total population of Durango, 12,430 people who reside within four miles of the site. Soil exposure targets include federally-listed threatened and endangered species; the Black-footed Ferret and the Knowlton's Cactus. Emergent riverine wetlands were identified at locations along the 15-mile target distance limit of the Animas River. There are five federally-listed threatened or endangered animal species that occur within the county including: the American Peregrine Falcon, Bald Eagle, Eskimo Curlew, Southwestern Willow Flycatcher, and the Mexican Spotted Owl. The drinking water supply for the city of Durango is obtained from the Florida River, located outside the 15 mile target distance limit, and the Animas River, where water is drawn from upgradient of the site. The Animas River is a recreational fishery and used for recreational activities including kayaking and fishing. Site access is controlled by locking gates at both entrances to the site area.

DOE sampling events have provided groundwater, and slag material data from before and after the DOE reclamation of the UMTRA Project area. Data from slag material left from the lead smelter operation indicates that there is a potential problem with leachable concentrations of lead that exceed the EP Toxicity allowable levels set by the EPA. Surface water and sediment data collected by the DOE did not meet specific HRS criteria and use acceptable detection limits to allow for comparison to applicable regulatory guidelines for targets potentially affected.

6.0 LIST OF REFERENCES

Bureau of Reclamation. 1981. "Environmental Impact Statement, Wastewater Management Plan for the Durango Area, La Plata County, Colorado," EPA 908/5-81-001A. January 1981.

Bureau of Reclamation. 1990. "Hydrogeochemical Site Characterization," Volumes I and II, Addendum #1 (September 1995) and #2 (August 1995). November 1990.

City of Durango. 1996. GIS Planning Map of the city of Durango obtained from the Planning Department.

Colorado Department of Public Health and the Environment (CDPHE). 1996. Personal communication with Wendy Naugle, Durango Mill Site UMTRA CDPHE Project Manager, Hazardous Materials and Waste Management Division. February 16, 1996.

Colorado Division of Wildlife (CDOW). 1996. Personal communication between Mike Japhet, Fisheries Biologist and Mark Rudolph, URS Operating Services, Inc. February 15, 1996.

Dunne, Thomas and Luna B. Leopold. 1978. "Water and Environmental Planning." W. H. Freeman and Company, San Francisco.

Durango Public Works. 1996. Personal communication between Eric Scott, UOS, and Jack Rogers, Public Works. February 20, 1996.

MK-Ferguson Company. 1995. Durango, Colorado, Final Completion Report, Volume 4, Appendices F-K. August 1995.

Office of the Federal Register (OFR). 1990. Code of Federal Regulation (CFR) 40, Part 300, "Hazard Ranking System (HRS) for Uncontrolled Hazardous Substances Releases." Appendix A of the National Oil and Hazardous Substance Release Contingency Plan; Final Rule, December 14, 1990.

Smith, Duane A. 1980. "Rocky Mountain Boom Town: A History of Durango." University of New Mexico Press, Albuquerque. 205 pgs.

State Engineer's Office. 1996. Well log listings obtained for the Durango, Colorado, area.

U.S. Department of Commerce (USDOC), Bureau of Census. 1990. "Census of Population and Housing, Colorado."

U.S. Department of Energy (DOE). 1989. Correspondence from Mark Matthews, DOE UMTRA Acting Project Manager, to Ed Bischoff, EPA, related to slag sampling including slag analytical data. December 4, 1989.

U.S. Department of Energy (DOE). 1995. "Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Durango, Colorado," and "UMTRA Project Water Sampling and Analysis Plan" Prepared for the U.S. Department of Energy Environmental Restoration Division UMTRA Project Team by Jacobs Engineering Group Inc. September 1995.

U.S. Environmental Protection Agency (EPA). 1995a. Site Inspection Prioritization, Analytical Results Report for the Durango Landfill, Durango, Colorado, CERCLIS ID# COD980499149; Prepared by Morrison Knudsen Corporation. September 7, 1995.

U.S. Environmental Protection Agency (EPA). 1995b. Superfund Chemical Data Matrix. September 1995.

U.S. Fish and Wildlife Service (USFWS). 1996. U.S. Fish and Wildlife Service, Ecological Services, Colorado Field Office, Federally Listed Species and Their Status in Colorado. February 15, 1996.

U.S. Geological Survey (USGS). 1963a. 7.5 Minute Topographic Quadrangle, Durango East, Colorado.

U.S. Geological Survey (USGS). 1963b. 7.5 Minute Topographic Quadrangle, Durango West, Colorado.

U.S. Geological Survey (USGS). 1983. 1:100,000 Scale Topographic Map, Durango, Colorado.

U.S. Geological Survey (USGS). 1984. "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States," U.S.G.S. Professional Paper 1270.

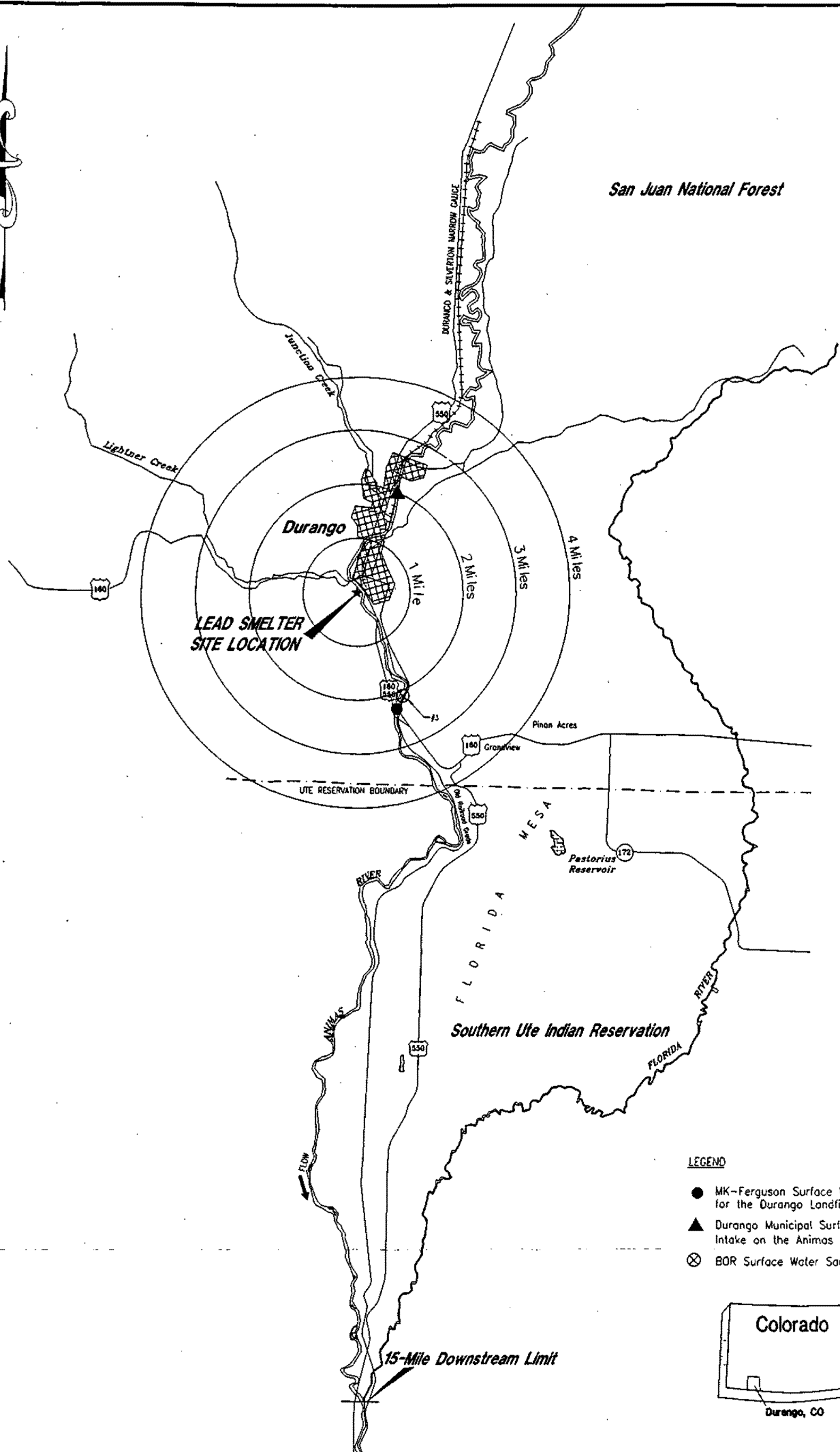
U.S. Geological Survey (USGS). 1994. "Water Resources Data, Colorado, Water Year 1994," Volume 2, Colorado River Basin, Water-Data Report CO-94-2.

University of Delaware, Center for Climate Research, Department of Geography. 1986. Terrestrial Water Budget Data Archive; Version 1.01, compiled by C. J. Willmott and C. M. Rowe.

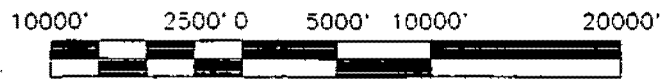
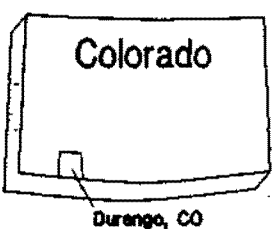
URS Operating Services, Inc. (UOS). 1996. Site reconnaissance conducted by UOS personnel; including logbook, site tours, and personnel interviews. February 20 and 21, 1996. February 20 and 21, 1996.

75-60201.00
START/Durango/Final-Pb,PA/Rev-1/Durango.Txt/rsb:bas:jnb


/disk0c/cadd/start/6020111.dwg jtr 4/1/96 11:39



- LEGEND**
- MK-Ferguson Surface Water Sample for the Durango Landfill SIP
 - ▲ Durango Municipal Surface Water Intake on the Animas River
 - ⊗ BOR Surface Water Sample




SOURCE:
USGS 1983
UOS 1996

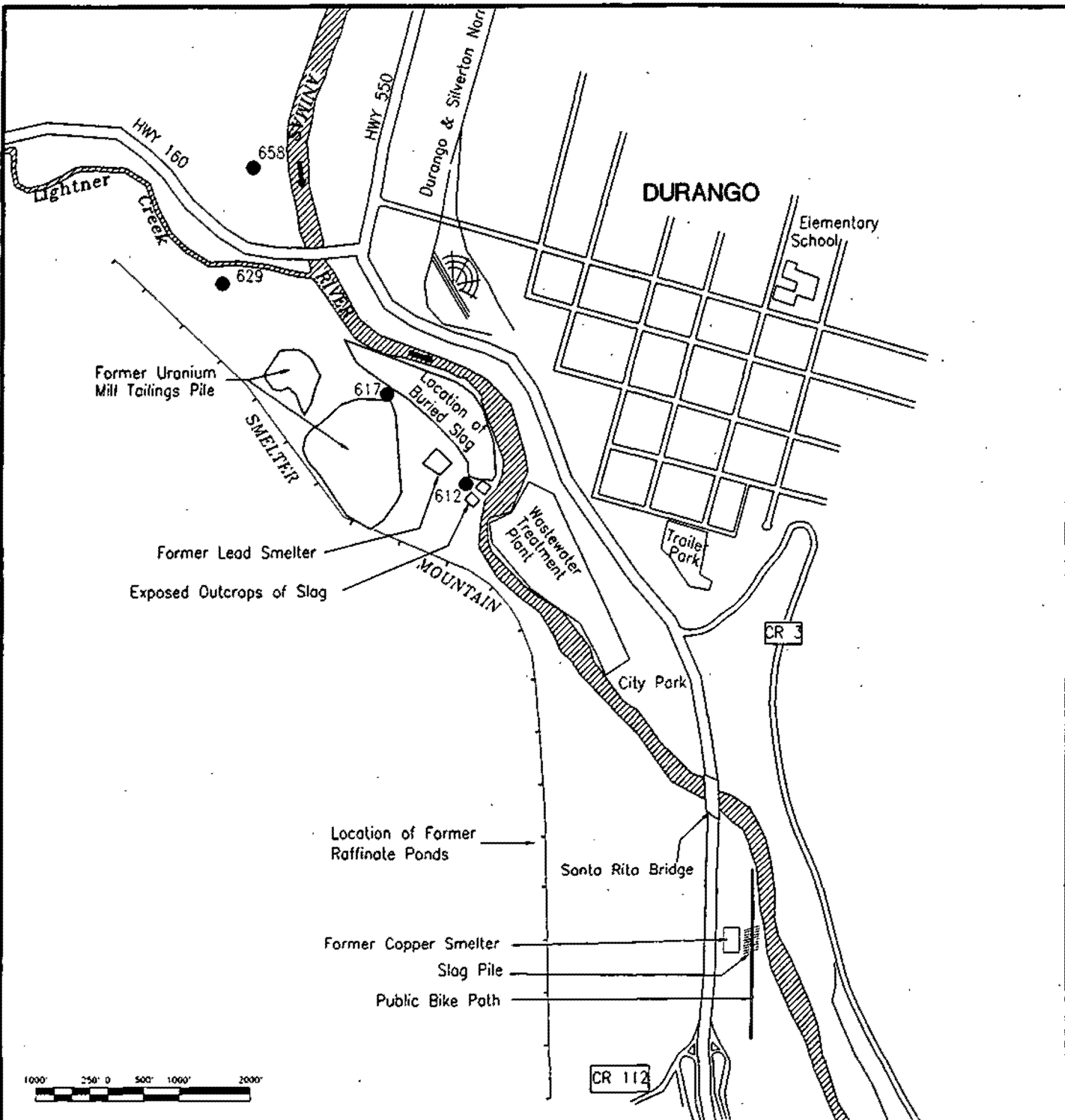
**PRELIMINARY ASSESSMENT**
UOS Job No. 75-60201

Durango Lead Smelter
Durango, Colorado

Area of Influence Map
Figure 1

April 1996

**URS**
OPERATING SERVICES



1000' 250' 0 500' 1000' 2000'



LEGEND

● DOE Groundwater Sample Locations

Source: City of Durango GIS Planning Map 1996;
 DOE 1995



| | |
|---|---|
|  | PRELIMINARY ASSESSMENT |
| | UOS Job No. 75-60201 |
| | Durango Lead Smelter Durango, Colorado |
| | Site Map Figure 2 |
| April 1996 | |
|  | |

TABLE 1
DOE Slag Samples
Total Metals

| | DU-SS-25-SPL Surface Slag (mg/kg) | DU-SS-26-SPL Surface Slag (mg/kg) | DU-SS-27-SPL Surface Slag (mg/kg) | DU-SS-28-SPL Composite at 3-4 (mg/kg) | DU-SS-29-SPL Composite at 10-12 (mg/kg) | DU-SS-30-SPL Surface Slag (mg/kg) | DU-SS-31-SPL Surface Slag (mg/kg) | DU-SS-32-SPL Composite at 4-61 (mg/kg) | DU-SS-33-SPL Granular (mg/kg) | DU-SS-34-SPL Surface Slag (mg/kg) | DU-SS-35-SPL Composite (mg/kg) |
|--|---|---|---|---|---|---|---|--|-------------------------------------|---|--------------------------------------|
| Antimony | 50 | 70 | 70 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Arsenic | 200 | 470 | 480 | 400 | 200 | 21 | 300 | 300 | 400 | 200 | 49 |
| Barium | 4,900 | 4,600 | 2,900 | 8,100 | 5,600 | 3,100 | 3,200 | 2,800 | 2,600 | 4,100 | 5,000 |
| Beryllium | <5 | 6 | <5 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| Cadmium | <5 | 51 | 20 | 20 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| Chromium | <20 | <20 | <20 | <40 | <40 | <40 | <40 | <40 | <40 | <40 | <40 |
| Cobalt | 35 | 120 | 49 | 81 | 40 | 20 | 30 | 40 | 160 | 30 | 20 |
| Copper | 1,900 | 3,400 | 3,100 | 5,400 | 3,500 | 1,700 | 2,300 | 2,100 | 4,000 | 2,400 | 1,800 |
| Lead | 5,300 | 21,000 | 8,900 | 25,000 | 8,300 | 3,500 | 15,000 | 8,900 | 22,000 | 11,000 | 5,900 |
| Mercury | <0.1 | 0.5 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Molybdenum | 20 | 110 | 40 | 80 | 63 | <20 | 60 | 90 | 150 | 110 | 100 |
| Nickel | <20 | <20 | <20 | <40 | <40 | <40 | <40 | <40 | <40 | <40 | <40 |
| Selenium | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Silver | 20 | 38 | 29 | 40 | 40 | 20 | 40 | 50 | 20 | 50 | 50 |
| Strontium | 630 | 280 | 430 | 290 | 400 | 620 | 220 | 480 | 150 | 350 | 360 |
| Thallium | 0.2 | 1.6 | 0.2 | 0.6 | 0.2 | 0.2 | 0.8 | <0.2 | 0.7 | 0.3 | 0.4 |
| Uranium as U ₃ O ₈ | 39 | 233 | 84 | 69 | 39 | 71 | 12 | 32 | 4 | 21 | 18 |
| Vanadium | 52 | 910 | 66 | 81 | 65 | 68 | 30 | 70 | 110 | 55 | 50 |
| Total Solids (%) | 100 | 98 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

- Analytical method: SW846 Test Methods for Evaluating Solid Waste, Third Edition, 1986. Method 3050.
- All sample results are reported on an "as received" (wet weight) basis. Total solids (%) results are provided for conversions to dry weight.
- Samples collected in 1989, prior to DOE UMTRA reclamation.

TABLE 2
DOE Slag Samples
EP Toxicity Metals

| | Action Levels EP Toxicity Maximum Concentration (mg/L) | DU-SS-25-SPL Surface Slag (mg/L) | DU-SS-26-SPL Surface Slag (mg/L) | DU-SS-27-SPL Surface Slag (mg/L) | DU-SS-28-SPL Composite at 3-4 (mg/L) | DU-SS-29-SPL Composite at 10-12 (mg/L) | DU-SS-30-SPL Surface Slag (mg/L) | DU-SS-31-SPL Surface Slag (mg/L) | DU-SS-32-SPL Composite at 4-61 (mg/L) | DU-SS-33-SPL Granular (mg/L) | DU-SS-34-SPL Surface Slag (mg/L) | DU-SS-35-SPL Composite (mg/L) |
|--|--|--|--|--|--|--|--|--|---|------------------------------------|--|-------------------------------------|
| Antimony | | 0.4 | <0.25 | <0.25 | 0.3 | 0.3 | 0.08 | 0.4 | <0.25 | <0.25 | <0.25 | <0.1 |
| Arsenic | 5.0 | <0.5 | <0.5 | <0.5 | <0.5 | 0.5 | 0.1 | 0.7 | 0.6 | 0.5 | <0.5 | <0.2 |
| Barium | 100.0 | 5.4 | 20 | 7.9 | 0.64 | 13 | 2.4 | 12 | 37 | 13 | 4.3 | 10 |
| Beryllium | | <0.025 | <0.025 | <0.025 | <0.025 | <0.01 | <0.005 | <0.025 | <0.025 | <0.025 | <0.025 | <0.01 |
| Cadmium | 1.0 | 0.06 | 0.05 | 0.1 | 0.55 | <0.02 | 0.02 | <0.05 | <0.05 | <0.05 | 0.08 | <0.02 |
| Chromium | 5.0 | <0.01 | <0.1 | <0.1 | <0.1 | <0.04 | <0.02 | <0.1 | <0.1 | <0.1 | <0.1 | <0.04 |
| Cobalt | | 0.1 | 0.51 | 0.2 | 0.3 | 0.1 | 0.06 | 0.1 | 0.1 | 0.7 | 0.1 | 0.07 |
| Copper | | <0.01 | <0.1 | <0.1 | 3.5 | <0.04 | 0.03 | <0.1 | <0.1 | <0.1 | <0.1 | <0.04 |
| Lead | 5.0 | 7.1 | 1.3 | 1.5 | 58 | 10 | 0.90 | 17 | 4.8 | 4.1 | 29 | 0.61 |
| Mercury | 0.2 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Molybdenum | | <0.01 | <0.1 | <0.1 | <0.1 | <0.04 | <0.02 | <0.1 | <0.1 | <0.1 | <0.1 | <0.02 |
| Nickel | | <0.01 | <0.1 | 0.1 | 0.2 | <0.04 | 0.06 | <0.1 | 0.2 | <0.1 | 0.1 | 0.05 |
| Selenium | 1.0 | <0.02 | 0.02 | <0.01 | <0.1 | <0.02 | <0.01 | <0.02 | <0.01 | <0.01 | <0.02 | <0.01 |
| Silver | 5.0 | <0.01 | <0.1 | <0.01 | <0.1 | <0.04 | <0.02 | <0.1 | <0.1 | <0.1 | <0.1 | <0.02 |
| Strontium | | 3.7 | 1.9 | 2.4 | 1.3 | 1.9 | 0.82 | 1.2 | 2.7 | 0.94 | 2.7 | 2.1 |
| Thallium | | <0.001 | 0.001 | 0.001 | 0.001 | 0.001 | <0.001 | <0.001 | 0.001 | <0.001 | <0.002 | <0.001 |
| Uranium as U ₃ O ₈ | | 0.077 | 0.399 | 0.367 | 0.367 | 0.170 | 0.258 | 0.040 | 0.145 | 0.017 | 0.026 | 0.022 |
| Vanadium | | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | <0.02 | <0.1 | <0.1 | <0.1 | <0.1 | <0.02 |

- Analytical Method: SW 846 Test Methods for Evaluating Solid Waste, Third Edition, 1986, Method 1310
- Samples collected in 1989, prior to DOE UMTRA reclamation.

TABLE 3
 DOE Groundwater Summary Tables

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted)

| Constituent ^a | Well ID | Filtered samples | | | | Unfiltered samples | |
|--------------------------|-----------|-------------------------------------|---------|---------------------|---------|-------------------------------------|-------------------------------|
| | | Frequency of detection ^b | Minimum | Median ^c | Maximum | Frequency of detection ^b | Maximum observed value (mg/L) |
| | | | (mg/L) | | | | |
| Inorganics | | | | | | | |
| Aluminum | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | <0.05 | <0.05 | <0.10 | NA | NA |
| | Plume 612 | 0/3 | <0.05 | <0.05 | <0.10 | NA | NA |
| | Plume 617 | 0/3 | <0.05 | <0.05 | <0.10 | NA | NA |
| Ammonium | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 1/2 | <0.10 | <0.15 | <0.20 | NA | NA |
| | Plume 617 | 1/2 | <0.10 | <0.15 | <0.20 | NA | NA |
| Antimony | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 1/4 | <0.003 | <0.007 | 0.022 | 1/1 | 0.025 |
| | Plume 617 | 1/4 | <0.003 | <0.007 | 0.018 | 1/1 | 0.017 |
| Arsenic | Bkg 629 | 0/1 | NA | <0.005 | NA | 0/1 | <0.005 |
| | Bkg 658 | NA | NA | NA | NA | 0/1 | <0.003 |
| | Plume 612 | 0/7 | <0.005 | <0.01 | <0.05 | 0/3 | <0.01 |
| | Plume 617 | 0/7 | <0.005 | <0.01 | <0.05 | 0/3 | <0.01 |
| Barium | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 3/5 | 0.01 | <0.03 | <0.10 | 0/1 | <0.10 |
| | Plume 617 | 2/5 | <0.01 | <0.02 | <0.10 | 0/1 | <0.10 |

BASELINE RISK ASSESSMENT OF GROUND WATER CONTAMINATION AT THE URANIUM MILL TAILINGS SITE NEAR DURANGO, COLORADO

MAGNITUDE AND EXTENT OF CONTAMINATION

DOE/EA-61350-175
REV. 1, VER. 1

13 SEPTEMBER 1995
DURANGO: WPA

TABLE 3
 DOE Groundwater Summary Tables
 (continued)

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted) (Continued)

| Constituent ^a | Well ID | Filtered samples | | | | Unfiltered samples | |
|--------------------------|-----------|-------------------------------------|---------|-------------------------------|---------|-------------------------------------|----------------------------------|
| | | Frequency of detection ^b | Minimum | Median ^c (mg/L) | Maximum | Frequency of detection ^b | Maximum observed value (mg/L) |
| | | | | | | | |
| Inorganics | | | | | | | |
| Beryllium | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/3 | <0.005 | <0.01 | <0.01 | 0/1 | <0.01 |
| | Plume 617 | 0/3 | <0.005 | <0.01 | <0.01 | 0/1 | <0.01 |
| Cadmium | Bkg 629 | 0/1 | NA | <0.001 | NA | 0/1 | <0.001 |
| | Bkg 658 | NA | NA | NA | NA | 0/1 | <0.001 |
| | Plume 612 | 6/7 | <0.001 | 0.038 | 0.070 | 3/3 | <0.05 |
| | Plume 617 | 1/7 | <0.001 | <0.001 | 0.003 | 0/3 | <0.001 |
| Calcium | Bkg 629 | 1/1 | NA | 278 | NA | 1/1 | 273 |
| | Bkg 658 | NA | NA | NA | NA | 1/1 | 85 |
| | Plume 612 | 7/7 | 226 | 424 | 477 | 3/3 | 451 |
| | Plume 617 | 7/7 | 466 | 481 | 499 | 3/3 | 496 |
| Chloride | Bkg 629 | 1/1 | NA | 23.9 | NA | 1/1 | 25.6 |
| | Bkg 658 | 1/1 | NA | NA | NA | 1/1 | 8.2 |
| | Plume 612 | 6/6 | 308 | 697 | 795 | 3/3 | 952 |
| | Plume 617 | 6/6 | 50 | 67 | 75 | 3/3 | 66 |
| Chromium | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/5 | <0.01 | <0.01 | <0.01 | 0/1 | <0.05 |
| | Plume 617 | 0/5 | <0.01 | <0.01 | <0.01 | 0/1 | <0.05 |

BASIS FOR RISK ASSESSMENT OF GROUND WATER CONTAMINATION AT THE URANIUM MILL TAILINGS SITE NEAR DURANGO, COLORADO

MAGNITUDE AND EXTENT OF CONTAMINATION

DOE/AUG-95-0175
 REV. 1, VER. 1

13 SEPTEMBER 1995
 D:\DOCS\START\

TABLE 3
 DOE Groundwater Summary Tables
 (continued)

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted) (Continued)

| Constituent ^a | Well ID | Filtered samples | | | | Unfiltered samples | |
|--------------------------|-----------|-------------------------------------|---------|-------------------------------|---------|-------------------------------------|----------------------------------|
| | | Frequency of detection ^b | Minimum | Median ^c (mg/L) | Maximum | Frequency of detection ^b | Maximum observed value (mg/L) |
| Inorganics | | | | | | | |
| Cobalt | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/3 | <0.03 | <0.05 | <0.05 | 0/1 | <0.05 |
| | Plume 617 | 0/3 | <0.03 | <0.05 | <0.05 | 0/1 | <0.05 |
| Copper | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/5 | <0.01 | <0.01 | <0.02 | 0/1 | <0.02 |
| | Plume 617 | 0/5 | <0.01 | <0.01 | <0.02 | 0/1 | <0.02 |
| Cyanide | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/3 | <0.01 | <0.01 | <0.01 | NA | NA |
| | Plume 617 | 0/3 | <0.01 | <0.01 | <0.01 | NA | NA |
| Fluoride | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 5/5 | 1.3 | 1.4 | 1.6 | 1/1 | 1.2 |
| | Plume 617 | 5/5 | 0.6 | 0.8 | 0.8 | 1/1 | 0.6 |
| Iron | Bkg 629 | 1/1 | NA | 0.28 | NA | 1/1 | 3.12 |
| | Bkg 658 | NA | NA | NA | NA | 1/1 | 0.20 |
| | Plume 612 | 2/7 | <0.03 | <0.03 | 0.12 | 2/3 | 1.3 |
| | Plume 617 | 3/7 | <0.03 | <0.03 | 0.15 | 3/3 | 5.2 |

BASIS: RISK ASSESSMENT OF GROUND WATER CONTAMINATION
 AT THE URANUM MILL TAILINGS SITE NEAR DURANGO, COLORADO

MAGNITUDE AND EXTENT OF CONTAMINATION

DOE/AUS/2350-175
 REV. 1, VSA, 1

13 SEPTEMBER 1991
 DURANGO, CO

TABLE 3
DOE Groundwater Summary Tables
 (continued)

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted) (Continued)

| Constituent ^a | Well ID | Filtered samples | | | | Unfiltered samples | |
|--------------------------|-----------|-------------------------------------|---------|-------------------------------|---------|-------------------------------------|----------------------------------|
| | | Frequency of detection ^b | Minimum | Median ^c (mg/L) | Maximum | Frequency of detection ^b | Maximum observed value (mg/L) |
| Inorganics | | | | | | | |
| Lead | Bkg 629 | 0/1 | NA | <0.003 | NA | 0/1 | <0.003 |
| | Bkg 658 | NA | NA | NA | NA | 0/1 | <0.003 |
| | Plume 612 | 1/7 | <0.003 | <0.01 | 0.02 | 1/3 | 0.012 |
| | Plume 617 | 0/7 | <0.003 | <0.01 | <0.03 | 1/3 | 0.042 |
| Magnesium | Bkg 629 | 1/1 | NA | 215 | NA | 1/1 | 205 |
| | Bkg 658 | NA | NA | NA | NA | 1/1 | 20 |
| | Plume 612 | 7/7 | 139 | 279 | 309 | 3/3 | 301 |
| | Plume 617 | 7/7 | 209 | 224 | 278 | 3/3 | 241 |
| Manganese | Bkg 629 | 1/1 | NA | 0.16 | NA | 1/1 | 0.26 |
| | Bkg 658 | NA | NA | NA | NA | 0/1 | <0.01 |
| | Plume 612 | 7/7 | 1.8 | 5.5 | 6.7 | 3/3 | 6.2 |
| | Plume 617 | 5/7 | <0.01 | 0.02 | 0.04 | 3/3 | 0.11 |
| Mercury | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/6 | <0.0002 | <0.0002 | <0.0002 | 0/2 | <0.0002 |
| | Plume 617 | 0/6 | <0.0002 | <0.0002 | <0.0002 | 0/2 | <0.0002 |
| Molybdenum | Bkg 629 | 1/1 | NA | 0.01 | NA | 0/1 | <0.01 |
| | Bkg 658 | NA | NA | NA | NA | 0/1 | <0.01 |
| | Plume 612 | 7/7 | 0.13 | 0.13 | 0.21 | 3/3 | 0.13 |
| | Plume 617 | 2/7 | <0.01 | <0.01 | 0.05 | 0/3 | <0.01 |

DOE/USDO-175
 REV. 1, VER. 1

13 SEPTEMBER 1993
 DUREOSF:W

BASELINE RISK ASSESSMENT OF GROUND WATER CONTAMINATION
 AT THE DURANGO MILL TAILINGS SITE NEAR DURANGO, COLORADO

MAGNITUDE AND EXTENT OF CONTAMINATION

TABLE 3
 DOE Groundwater Summary Tables
 (continued)

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted) (Continued)

| Constituent ^a | Well ID | Frequency of detection ^b | Filtered samples | | | Unfiltered samples | |
|--------------------------|-----------|-------------------------------------|------------------|-------------------------------|---------|-------------------------------------|----------------------------------|
| | | | Minimum | Median ^c (mg/L) | Maximum | Frequency of detection ^b | Maximum observed value (mg/L) |
| Inorganics | | | | | | | |
| Nitrate | Bkg G29 | 0/1 | NA | NA | NA | 0/1 | <1.0 |
| | Bkg G50 | NA | NA | NA | NA | NA | NA |
| | Plume G12 | 5/5 | 2.0 | 5.0 | 12 | 2/2 | 7.0 |
| | Plume G17 | 5/5 | 1.0 | 4.4 | 28 | 2/2 | 8.4 |
| Nickel | Bkg G29 | NA | NA | NA | NA | NA | NA |
| | Bkg G50 | NA | NA | NA | NA | NA | NA |
| | Plume G12 | 0/5 | <0.04 | <0.04 | <0.04 | 0/1 | <0.04 |
| | Plume G17 | 0/5 | <0.04 | <0.04 | <0.04 | 0/1 | <0.04 |
| Potassium | Bkg G29 | 1/1 | NA | 4.57 | NA | 1/1 | 4.78 |
| | Bkg G50 | 1/1 | NA | NA | NA | 1/1 | 2.3 |
| | Plume G12 | 7/7 | 16 | 30 | 34 | 3/3 | 33 |
| | Plume G17 | 7/7 | 17 | 19 | 22 | 3/3 | 22 |
| Selenium | Bkg G29 | 0/1 | NA | <0.005 | NA | 0/1 | <0.005 |
| | Bkg G50 | 0/1 | NA | NA | NA | 0/1 | <0.005 |
| | Plume G12 | 5/7 | 0.008 | 0.034 | 0.09 | 3/3 | 0.08 |
| | Plume G17 | 7/7 | 0.007 | 0.087 | 0.16 | 3/3 | 0.08 |
| Silica | Bkg G29 | 1/1 | NA | 9.7 | NA | 1/1 | 13.8 |
| | Bkg G50 | 1/1 | NA | NA | NA | 1/1 | 7.1 |
| | Plume G12 | 2/2 | 22 | 23 | 23 | 2/2 | 23 |
| | Plume G17 | 2/2 | 14 | 14 | 15 | 2/2 | 29 |

BASELINE RISK ASSESSMENT OF GROUNDWATER CONTAMINATION
 AT THE URANIUM MILL TAILINGS SITE NEAR DURANGO, COLORADO

MAINTENANCE AND EXTENT OF CONTAMINATION

DOE/AC/3350-175
 REV. 1, VER. 1

13 SEPTEMBER 1995
 DURANGO, CO

TABLE 3
 DOE Groundwater Summary Tables
 (continued)

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted) (Continued)

| Constituent ^a | Well ID | Filtered samples | | | | Unfiltered samples | |
|--------------------------|-----------|-------------------------------------|---------|-------------------------------|---------|-------------------------------------|----------------------------------|
| | | Frequency of detection ^b | Minimum | Median ^c (mg/L) | Maximum | Frequency of detection ^b | Maximum observed value (mg/L) |
| Inorganics | | | | | | | |
| Silver | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 1/5 | <0.01 | <0.01 | 0.01 | 0/1 | <0.01 |
| | Plume 617 | 0/5 | <0.01 | <0.01 | <0.01 | 0/1 | <0.01 |
| Sodium | Bkg 629 | 1/1 | NA | 473 | NA | 1/1 | 478 |
| | Bkg 658 | NA | NA | NA | NA | 1/1 | 25 |
| | Plume 612 | 7/7 | 516 | 1120 | 1200 | 3/3 | 1190 |
| | Plume 617 | 7/7 | 231 | 271 | 288 | 3/3 | 287 |
| Strontium | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 3/3 | 3.3 | 3.4 | 3.7 | NA | NA |
| | Plume 617 | 3/3 | 3.3 | 3.4 | 3.6 | NA | NA |
| Sulfate | Bkg 629 | 1/1 | NA | 1860 | NA | 1/1 | 1830 |
| | Bkg 658 | NA | NA | NA | NA | 1/1 | 83 |
| | Plume 612 | 6/6 | 1540 | 3110 | 3290 | 3/3 | NA |
| | Plume 617 | 6/6 | 2080 | 2160 | 2230 | 3/3 | 2250 |
| Sulfide | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/3 | <0.1 | <0.1 | <0.1 | NA | NA |
| | Plume 617 | 0/3 | <0.1 | <0.1 | <0.1 | NA | NA |

BASELINE RISK ASSESSMENT OF GROUND WATER CONTAMINATION
 AT THE URANUM MILL TAILINGS SITE NEAR DURANGO, COLORADO

MAGNITUDE AND EXTENT OF CONTAMINATION

TABLE 3
 DOE Groundwater Summary Tables
 (continued)

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted) (Continued)

| Constituent ^a | Well ID | Frequency of detection ^b | Filtered samples | | | Unfiltered samples | |
|--------------------------|-----------|-------------------------------------|------------------|-------------------------------|---------|-------------------------------------|----------------------------------|
| | | | Minimum | Median ^c (mg/L) | Maximum | Frequency of detection ^b | Maximum observed value (mg/L) |
| Inorganics | | | | | | | |
| Thallium | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 0/4 | <0.01 | <0.01 | <0.03 | 0/3 | <0.01 |
| | Plume 617 | 0/4 | <0.005 | <0.01 | <0.03 | 0/2 | <0.01 |
| Tin | Bkg 629 | NA | NA | NA | NA | NA | NA |
| | Bkg 658 | NA | NA | NA | NA | NA | NA |
| | Plume 612 | 1/3 | <0.005 | <0.015 | 0.015 | 1/1 | 0.015 |
| | Plume 617 | 1/3 | <0.005 | <0.007 | 0.007 | 1/1 | 0.006 |
| Uranium | Bkg 629 | 1/1 | NA | 0.002 | NA | 1/1 | 0.002 |
| | Bkg 658 | NA | NA | NA | NA | 1/1 | 0.002 |
| | Plume 612 | 6/6 | 1.5 | 3.0 | 3.8 | 3/3 | 4.0 |
| | Plume 617 | 7/7 | 0.12 | 0.25 | 0.28 | 3/3 | 0.29 |
| Vanadium | Bkg 629 | 0/1 | NA | <0.01 | NA | 1/1 | <0.01 |
| | Bkg 658 | NA | NA | NA | NA | 0/1 | <0.01 |
| | Plume 612 | 7/7 | 0.31 | 0.47 | 0.53 | 3/3 | 0.52 |
| | Plume 617 | 1/7 | <0.01 | <0.01 | 0.01 | 0/3 | <0.01 |
| Zinc | Bkg 629 | 0/1 | NA | <0.05 | NA | 1/1 | 0.08 |
| | Bkg 658 | NA | NA | NA | NA | 1/1 | 0.11 |
| | Plume 612 | 7/7 | 0.88 | 2.6 | 3.3 | 3/3 | 3.2 |
| | Plume 617 | 7/7 | 0.060 | 0.085 | 0.15 | 3/3 | 0.20 |

BASELINE RISK ASSESSMENT OF GROUNDWATER CONTAMINATION AT THE URANIUM MILL TAILINGS SITE NEAR DURANGO, COLORADO

MAGNITUDE AND EXTENT OF CONTAMINATION

DOE/EA/5350-175
REV. 1, VER. 1

13 SEPTEMBER 1995
DURANGO, WY

TABLE 3
 DOE Groundwater Summary Tables
 (continued)

Table 3.2 Summary of ground water quality data at the mill tailings area at Durango, Colorado, May 1990 - June 1994 (filtered samples, except as noted) (Continued)

| Constituent ^a | Well ID | Number of samples | Minimum (pCi/L) | Median ^c (pCi/L) | Maximum (pCi/L) |
|----------------------------------|-----------|-------------------|-----------------|-----------------------------|-----------------|
| Radionuclides^d | | | | | |
| Lead-210 | Bkg 629 | 1 | NA | 3.6 | NA |
| | Bkg 658 | 0 | NA | NA | NA |
| | Plume 612 | 2 | 0.4 | 2.4 | 4.4 |
| | Plume 617 | 2 | 0.6 | 1.8 | 3.0 |
| Polonium-210 | Bkg 629 | 1 | NA | 0.1 | NA |
| | Bkg 658 | 0 | NA | NA | NA |
| | Plume 612 | 2 | 0.1 | 0.1 | 0.1 |
| | Plume 617 | 2 | 0.0 | 0.1 | 0.2 |
| Radium-226 | Bkg 629 | 1 | NA | 1.0 | NA |
| | Bkg 658 | 1 | NA | 0.1 | NA |
| | Plume 612 | 3 | 0.0 | 0.1 | 1.2 |
| | Plume 617 | 3 | 0.0 | 0.2 | 0.2 |
| Radium-228 ^e | Bkg 629 | 1 | NA | 0.0 | NA |
| | Bkg 658 | 1 | NA | 0.0 | NA |
| | Plume 612 | 3 | 0.0 | 0.7 | 1.1 |
| | Plume 617 | 3 | 0.0 | 0.4 | 1.0 |

DOE/EA-3350-175
 REV. 1, VER. 1

BASING RISK ASSESSMENT OF GROUND WATER CONTAMINATION
 AT THE URANUM MILL TAILINGS SITE NEAR DURANGO, COLORADO
 MAGNITUDE AND EXTENT OF CONTAMINATION

TABLE 4
 Bureau of Reclamation Groundwater Summary Tables

Durango Pumping Plant - Ground Water Contaminants

| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Pb mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 03-Mar-92 | DM-110 | < 2 | < 0.001 | < 1.0 | 0.007 | < 0.02 | < 0.02 | < 0.25 | 1.20 |
| 26-Dec-91 | DM-110 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | 3.00 |
| 20-Sep-91 | DM-110 | < 2 | < 0.001 | < 1.0 | 0.014 | < 0.05 | < 0.04 | < 0.25 | 3.10 |
| 20-Sep-91 | DM-110 Z | < 2 | < 0.001 | < 1.0 | 0.010 | < 0.05 | < 0.02 | < 0.25 | 3.40 |
| 13-Jun-91 | DM-110 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | 2.80 |
| 20-Nov-90 | DM-110 | < 2 | < 0.001 | < 1.0 | < 0.005 | 0.02 | < 0.01 | < 0.02 | 2.60 |
| 16-Oct-90 | DM-110 | < 2 | < 0.001 | < 0.5 | < 0.005 | 0.02 | < 0.01 | < 0.05 | 3.40 |
| 23-May-90 | DM-110 | < 2 | < 0.001 | 0.1 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | 2.50 |
| 23-May-90 | DM-110 U | < 2 | < 0.001 | < 0.1 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | 4.40 |

| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Pb mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 03-Mar-92 | DM-111 | < 2 | < 0.001 | < 1.0 | 0.003 | < 0.02 | < 0.02 | < 0.25 | 0.80 |
| 26-Dec-91 | DM-111 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | 0.70 |
| 20-Sep-91 | DM-111 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.05 | < 0.02 | < 0.25 | 0.50 |
| 13-Jun-91 | DM-111 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 03-May-91 | DM-111 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | 6.92 | < 0.03 | 0.30 |
| 20-Nov-90 | DM-111 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 16-Oct-90 | DM-111 | < 2 | < 0.001 | < 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.05 |
| 23-May-90 | DM-111 | < 2 | < 0.001 | 0.1 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | 0.30 |

| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Pb mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 03-Mar-92 | DM-112 | < 2 | < 0.001 | < 1.0 | 0.002 | < 0.04 | < 0.02 | < 0.25 | < 0.30 |
| 26-Dec-91 | DM-112 Z | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 26-Dec-91 | DM-112 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Sep-91 | DM-112 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.05 | < 0.02 | < 0.25 | < 0.20 |
| 13-Jun-91 | DM-112 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 13-Jun-91 | DM-112 U | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 03-May-91 | DM-112 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.03 | 0.20 |
| 20-Nov-90 | DM-112 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 16-Oct-90 | DM-112 | < 2 | < 0.001 | < 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | 0.09 |
| 23-May-90 | DM-112 U | < 2 | < 0.001 | < 0.1 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | 0.68 |
| 23-May-90 | DM-112 | < 2 | < 0.001 | < 0.1 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | 0.20 |

| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Pb mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 03-Mar-92 | DM-113 | < 2 | < 0.001 | < 1.0 | 0.001 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 03-May-92 | DM-113 A | < 2 | < 0.001 | < 1.0 | 0.001 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 26-Dec-91 | DM-113 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Sep-91 | DM-113 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.05 | < 0.02 | < 0.25 | < 0.20 |
| 13-Jun-91 | DM-113 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Nov-90 | DM-113 | < 2 | 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 16-Oct-90 | DM-113 | < 2 | < 0.001 | 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | 0.06 |
| 23-May-90 | DM-113 U | < 2 | 0.003 | 0.1 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | 1.20 |
| 23-May-90 | DM-113 | < 2 | 0.001 | 0.6 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | 0.25 |
| 23-May-90 | DM-113 A | < 2 | < 0.001 | 0.2 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | < 0.30 |

| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Pb mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 03-Mar-92 | DM-114 | < 2 | < 0.001 | < 1.0 | < 0.001 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 26-Dec-91 | DM-114 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Sep-91 | DM-114 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.05 | < 0.02 | < 0.25 | < 0.20 |
| 13-Jun-91 | DM-114 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 03-May-91 | DM-114 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.03 | 0.10 |
| 20-Nov-90 | DM-114 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 16-Oct-90 | DM-114 Z | < 2 | < 0.001 | < 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.05 |
| 16-Oct-90 | DM-114 | < 2 | < 0.001 | < 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.05 |
| 23-May-90 | DM-114 | < 2 | < 0.001 | 0.1 | < 0.05 | < 0.01 | < 0.05 | < 0.05 | < 0.03 |

TABLE 4
 Bureau of Reclamation Groundwater Summary Tables
 (continued)

Durango Pumping Plant - Ground Water Contaminants

| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Fe mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 03-Mar-92 | DM-115 | < 2 | < 0.001 | < 1.0 | < 0.001 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 03-May-92 | DM-115 | < 2 | < 0.001 | < 1.0 | < 0.001 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 26-Dec-91 | DM-115 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Sep-91 | DM-115 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.05 | < 0.02 | < 0.25 | < 0.20 |
| 13-Jun-91 | DM-115 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Nov-90 | DM-115 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 20-Nov-90 | DM-115 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 16-Oct-90 | DM-115 | < 2 | < 0.001 | < 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | 0.21 |
| 23-May-90 | DM-115 | < 2 | < 0.001 | 0.3 | | < 0.05 | < 0.01 | < 0.05 | 0.05 |
| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Fe mg/L |
| 03-Mar-92 | DM-116 | < 2 | < 0.001 | < 1.0 | 0.002 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 26-Dec-91 | DM-116 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Sep-91 | DM-116 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.05 | < 0.02 | < 0.25 | < 0.20 |
| 13-Jun-91 | DM-116 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 13-Jun-91 | DM-116 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Nov-90 | DM-116 | < 2 | 0.004 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 16-Oct-90 | DM-116 | < 2 | < 0.001 | < 0.5 | < 0.005 | 0.02 | < 0.01 | < 0.02 | 0.05 |
| 16-Oct-90 | DM-116 | < 2 | < 0.001 | < 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.05 |
| 23-May-90 | DM-116 | < 2 | < 0.001 | 0.1 | | < 0.05 | < 0.01 | < 0.05 | 0.07 |
| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Fe mg/L |
| 03-Mar-92 | DM-117 | < 2 | 0.002 | < 1.0 | < 0.001 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 26-Dec-91 | DM-117 | < 2 | < 0.003 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Sep-91 | DM-117 | < 2 | 0.004 | < 1.0 | 0.012 | < 0.05 | < 0.02 | < 0.25 | < 0.20 |
| 13-Jun-91 | DM-117 | < 2 | 0.002 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Nov-90 | DM-117 | < 2 | 0.005 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | 5.10 |
| 16-Oct-90 | DM-117 | < 2 | 0.001 | < 0.5 | < 0.005 | 0.02 | < 0.01 | < 0.02 | 0.52 |
| 23-May-90 | DM-117 | < 2 | 0.002 | 0.1 | | < 0.05 | < 0.01 | < 0.05 | 0.29 |
| DATE | DRILL HOLE | Al mg/L | As mg/L | Ba mg/L | Cd mg/L | Co mg/L | Cr mg/L | Cu mg/L | Fe mg/L |
| 03-Mar-92 | DM-118 | < 2 | < 0.001 | < 1.0 | < 0.001 | < 0.02 | < 0.02 | < 0.25 | < 0.30 |
| 26-Dec-91 | DM-118 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Sep-91 | DM-118 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.05 | < 0.02 | < 0.25 | < 0.20 |
| 13-Jun-91 | DM-118 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.02 | < 0.25 | < 0.50 |
| 20-Nov-90 | DM-118 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 20-Nov-90 | DM-118 | < 2 | < 0.001 | < 1.0 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.50 |
| 16-Oct-90 | DM-118 | < 2 | < 0.001 | < 0.5 | < 0.005 | < 0.02 | < 0.01 | < 0.02 | < 0.05 |
| 23-May-90 | DM-112 U | < 2 | < 0.001 | < 0.1 | | < 0.05 | < 0.01 | < 0.05 | 1.80 |
| 23-May-90 | DM-112 | < 2 | < 0.001 | 0.2 | | < 0.05 | < 0.01 | < 0.05 | 0.06 |

TABLE 4
 Bureau of Reclamation Groundwater Summary Tables
 (continued)

Durango Pumping Plant - Ground Water Contaminants

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Sa mg/L | Y mg/L | Zn mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DE-110 | < 0.001 | 0.3 | 3.4 | < 0.1 | < 0.05 | < 0.05 | 0.039 | < 0.05 | < 0.25 |
| 26-Dec-91 | DE-110 | < 0.001 | 0.3 | 3.3 | < 0.1 | < 0.04 | < 0.02 | 0.002 | 0.02 | < 0.25 |
| 20-Sep-91 | DE-110 | < 0.001 | 0.3 | 3.3 | < 0.05 | < 0.05 | < 0.02 | 0.006 | < 0.02 | < 0.25 |
| 20-Sep-91 | DE-110R | < 0.001 | 0.3 | 3.4 | < 0.05 | < 0.05 | < 0.02 | 0.004 | < 0.02 | < 0.25 |
| 13-Jun-91 | DE-110 | < 0.001 | 0.3 | 2.6 | < 0.05 | < 0.02 | < 0.02 | 0.14 | < 0.02 | < 0.25 |
| 20-Nov-90 | DE-110 | < 0.001 | 0.26 | 3.7 | < 0.02 | < 0.05 | < 0.02 | 0.001 | < 0.02 | 0.06 |
| 16-Oct-90 | DE-110 | < 0.001 | | 4.2 | < 0.05 | < 0.05 | < 0.02 | 0.007 | < 0.02 | 0.13 |
| 23-May-90 | DE-110 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.044 | < 0.05 | 0.13 |
| 23-May-90 | DE-110U | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.064 | < 0.05 | 0.11 |

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Sa mg/L | Y mg/L | Zn mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DE-111 | < 0.001 | 1.5 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | < 0.001 | < 0.05 | < 0.25 |
| 26-Dec-91 | DE-111 | < 0.001 | 1.3 | < 0.2 | < 0.1 | < 0.04 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 20-Sep-91 | DE-111 | < 0.001 | 1.3 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 13-Jun-91 | DE-111 | < 0.001 | 1.5 | < 0.2 | < 0.05 | < 0.02 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 03-May-91 | DE-111 | < 0.001 | 1.7 | < 0.2 | < 0.05 | < 0.02 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 20-Nov-90 | DE-111 | < 0.001 | 0.9 | 0.12 | < 0.02 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | 0.05 |
| 16-Oct-90 | DE-111 | < 0.001 | | 0.13 | < 0.05 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | 0.05 |
| 23-May-90 | DE-111 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | < 0.001 | < 0.05 | 0.05 |

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Sa mg/L | Y mg/L | Zn mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DE-112 | < 0.001 | 0.3 | 0.2 | < 0.1 | < 0.05 | < 0.02 | 0.04 | < 0.05 | < 0.25 |
| 26-Dec-91 | DE-112R | < 0.001 | 0.3 | 0.3 | < 0.1 | < 0.04 | < 0.02 | 0.01 | 0.02 | < 0.25 |
| 26-Dec-91 | DE-112 | < 0.001 | 0.3 | 0.3 | < 0.1 | < 0.04 | < 0.02 | 0.004 | < 0.02 | < 0.25 |
| 20-Sep-91 | DE-112 | < 0.001 | 0.3 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | 0.005 | < 0.02 | < 0.25 |
| 13-Jun-91 | DE-112 | < 0.001 | 0.3 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | 0.002 | < 0.02 | < 0.25 |
| 13-Jun-91 | DE-112U | < 0.001 | 0.3 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | 0.15 | < 0.02 | < 0.25 |
| 03-May-91 | DE-112 | < 0.001 | 0.3 | 0.2 | < 0.05 | < 0.05 | < 0.02 | 0.172 | < 0.02 | < 0.25 |
| 20-Nov-90 | DE-112 | < 0.001 | 0.3 | 0.19 | < 0.02 | < 0.05 | < 0.02 | 0.003 | < 0.02 | < 0.25 |
| 16-Oct-90 | DE-112 | < 0.001 | | 0.17 | < 0.05 | < 0.05 | < 0.02 | 0.001 | < 0.02 | < 0.25 |
| 23-May-90 | DE-112U | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.004 | < 0.05 | < 0.01 |
| 23-May-90 | DE-112 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.007 | < 0.05 | < 0.01 |

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Sa mg/L | Y mg/L | Zn mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DE-113 | < 0.001 | 0.4 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | < 0.001 | < 0.05 | < 0.25 |
| 03-May-92 | DE-113A | < 0.001 | < 0.1 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | 0.03 | < 0.05 | < 0.25 |
| 26-Dec-91 | DE-113 | < 0.001 | 0.5 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 20-Sep-91 | DE-113 | < 0.001 | 0.5 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 13-Jun-91 | DE-113 | < 0.001 | 0.5 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 20-Nov-90 | DE-113 | < 0.001 | 0.58 | 0.05 | < 0.02 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.25 |
| 16-Oct-90 | DE-113 | < 0.001 | | 0.05 | < 0.05 | < 0.05 | < 0.02 | < 0.001 | < 0.05 | < 0.25 |
| 23-May-90 | DE-113U | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.27 | < 0.05 | 0.22 |
| 23-May-90 | DE-113 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.004 | < 0.05 | 0.05 |
| 23-May-90 | DE-113A | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.235 | < 0.05 | 0.09 |

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Sa mg/L | Y mg/L | Zn mg/L |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DE-114 | < 0.001 | 0.1 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | 0.057 | < 0.05 | < 0.25 |
| 26-Dec-91 | DE-114 | < 0.001 | 0.2 | 0.2 | < 0.1 | < 0.04 | < 0.02 | 0.003 | < 0.02 | < 0.25 |
| 20-Sep-91 | DE-114 | < 0.001 | 0.2 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | 0.003 | < 0.02 | < 0.25 |
| 13-Jun-91 | DE-114 | < 0.001 | 0.2 | < 0.2 | < 0.05 | < 0.02 | < 0.02 | 0.034 | < 0.02 | < 0.25 |
| 03-May-91 | DE-114 | < 0.001 | 0.2 | < 0.2 | < 0.05 | < 0.02 | < 0.02 | 0.049 | < 0.02 | < 0.25 |
| 20-Nov-90 | DE-114 | < 0.001 | 0.19 | 0.03 | < 0.02 | < 0.05 | < 0.02 | 0.058 | < 0.02 | < 0.25 |
| 16-Oct-90 | DE-114R | < 0.001 | | 0.03 | < 0.05 | < 0.05 | < 0.02 | 0.059 | < 0.02 | < 0.25 |
| 16-Oct-90 | DE-114 | < 0.001 | | 0.02 | < 0.05 | < 0.05 | < 0.02 | 0.059 | < 0.02 | < 0.25 |
| 23-May-90 | DE-114 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.057 | < 0.05 | < 0.25 |

TABLE 4
 Bureau of Reclamation Groundwater Summary Tables
 (continued)

Durango Pumping Plant - Ground Water Contaminants

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Se mg/L | Y mg/L | Zn mg/L |
|-----------|---------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DM-115 | < 0.001 | 0.3 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | 0.002 | < 0.05 | < 0.05 |
| 03-May-92 | DM-115R | < 0.001 | 0.2 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | 0.022 | < 0.05 | < 0.05 |
| 26-Dec-91 | DM-115 | < 0.001 | 0.2 | < 0.2 | < 0.1 | < 0.04 | < 0.02 | 0.002 | 0.02 | < 0.05 |
| 20-Sep-91 | DM-115 | < 0.001 | 0.4 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | 0.004 | < 0.02 | < 0.05 |
| 13-Jun-91 | DM-115 | < 0.001 | 0.3 | < 0.2 | < 0.05 | < 0.02 | < 0.02 | 0.002 | < 0.02 | < 0.05 |
| 20-Nov-90 | DM-115R | < 0.001 | 0.25 | 0.05 | < 0.02 | < 0.05 | < 0.02 | 0.012 | < 0.02 | < 0.05 |
| 20-Nov-90 | DM-115 | < 0.001 | 0.29 | 0.05 | < 0.02 | < 0.05 | < 0.02 | 0.012 | < 0.02 | < 0.05 |
| 16-Oct-90 | DM-115 | < 0.001 | | 0.05 | < 0.05 | < 0.05 | < 0.005 | 0.025 | < 0.02 | < 0.05 |
| 23-May-90 | DM-115 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.018 | < 0.05 | 0.04 |

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Se mg/L | Y mg/L | Zn mg/L |
|-----------|---------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DM-116 | < 0.001 | < 0.1 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | 0.37 | < 0.05 | < 0.05 |
| 26-Dec-91 | DM-116 | < 0.001 | < 0.1 | < 0.2 | < 0.1 | < 0.04 | < 0.02 | 0.112 | < 0.02 | < 0.05 |
| 20-Sep-91 | DM-116 | < 0.001 | < 0.1 | 0.3 | < 0.05 | < 0.05 | < 0.02 | 0.065 | < 0.02 | < 0.05 |
| 13-Jun-91 | DM-116R | < 0.001 | 0.3 | 1.9 | < 0.05 | < 0.02 | < 0.02 | 0.006 | < 0.02 | < 0.05 |
| 13-Jun-91 | DM-116 | < 0.001 | 0.3 | 1.9 | < 0.05 | < 0.02 | < 0.02 | 0.006 | < 0.02 | < 0.05 |
| 20-Nov-90 | DM-116 | < 0.001 | < 0.1 | 0.54 | < 0.02 | < 0.05 | < 0.02 | 0.009 | < 0.02 | 0.15 |
| 16-Oct-90 | DM-116R | < 0.001 | | 2.8 | < 0.05 | < 0.05 | < 0.02 | 0.023 | < 0.02 | < 0.05 |
| 16-Oct-90 | DM-116 | < 0.001 | | 2.7 | < 0.05 | < 0.05 | < 0.02 | 0.023 | < 0.02 | < 0.05 |
| 23-May-90 | DM-116 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.011 | < 0.05 | 0.06 |

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Se mg/L | Y mg/L | Zn mg/L |
|-----------|---------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DM-117 | < 0.001 | 0.2 | 4.3 | < 0.1 | < 0.05 | 0.03 | 0.001 | < 0.05 | < 0.05 |
| 26-Dec-91 | DM-117 | < 0.001 | 0.2 | 4.2 | < 0.1 | < 0.04 | < 0.02 | 0.002 | < 0.02 | < 0.05 |
| 20-Sep-91 | DM-117 | < 0.001 | 0.2 | 6.1 | < 0.05 | < 0.05 | < 0.02 | 0.001 | < 0.02 | < 0.05 |
| 13-Jun-91 | DM-117 | < 0.001 | 0.3 | 3.4 | < 0.05 | < 0.02 | < 0.02 | < 0.001 | < 0.02 | < 0.05 |
| 20-Nov-90 | DM-117 | < 0.001 | 0.35 | 7.6 | < 0.02 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | 0.08 |
| 16-Oct-90 | DM-117 | < 0.001 | | 5.9 | < 0.05 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | 0.08 |
| 23-May-90 | DM-117 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | 0.002 | < 0.05 | 0.06 |

| DATE | DRILL HOLE | Hg mg/L | Li mg/L | Mn mg/L | Mo mg/L | Ni mg/L | Pb mg/L | Se mg/L | Y mg/L | Zn mg/L |
|-----------|---------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| 03-Mar-92 | DM-118 | < 0.001 | 0.2 | < 0.2 | < 0.1 | < 0.05 | < 0.02 | < 0.001 | < 0.05 | < 0.05 |
| 26-Dec-91 | DM-118 | < 0.001 | 0.2 | < 0.2 | < 0.1 | < 0.02 | < 0.02 | < 0.001 | < 0.02 | < 0.05 |
| 20-Sep-91 | DM-118 | < 0.001 | 0.3 | < 0.2 | < 0.05 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.05 |
| 13-Jun-91 | DM-118 | < 0.001 | 0.2 | < 0.2 | < 0.05 | < 0.02 | < 0.02 | < 0.001 | < 0.02 | < 0.05 |
| 20-Nov-90 | DM-118R | < 0.001 | 0.24 | 0.02 | < 0.02 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.05 |
| 20-Nov-90 | DM-118 | < 0.001 | 0.25 | 0.02 | < 0.02 | < 0.05 | < 0.02 | < 0.001 | < 0.02 | < 0.05 |
| 16-Oct-90 | DM-118 | < 0.001 | | < 0.02 | < 0.05 | < 0.05 | < 0.005 | < 0.001 | < 0.02 | < 0.05 |
| 23-May-90 | DM-112U | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | < 0.001 | < 0.05 | 0.04 |
| 23-May-90 | DM-112 | < 0.001 | | | < 0.05 | < 0.04 | < 0.02 | < 0.001 | < 0.05 | 0.04 |

APPENDIX A

PA Report Form 2050-0095



Potential Hazardous Waste Site Preliminary Assessment Form

Identification

 State: CO CERCLIS Number: CO 0001399633

 CERCLIS Discovery Date: 2/96

1. General Site Information

| | | | | | |
|------------------------------------|--------------------------------------|--|-------------------------|--|----------------------|
| Name: <u>Durango Lead Smelter</u> | | Street Address: <u>SW of Hwys. 160 & 550 Intersection</u> | | | |
| City: <u>Durango</u> | State: <u>CO</u> | Zip Code: <u>81301</u> | County: <u>La Plata</u> | Co. Code: <u>007</u> | Cong. Dist: <u>-</u> |
| Latitude: <u>37° 16' 03.00" N.</u> | Longitude: <u>107° 53' 00.00" W.</u> | Approximate Area of Site: <u>15</u> Acres <u>653,400</u> Square Ft. | | Status of Site: <input type="checkbox"/> Active <input type="checkbox"/> Not Specified <input checked="" type="checkbox"/> Inactive <input type="checkbox"/> NA (GW plume, etc.) | |

2. Owner/Operator Information

| | | | | | |
|---|------------------------|----------------------------------|---|--------------------|-----------------------|
| Owner: <u>State of Colorado</u> | | | Operator: <u>Same</u> | | |
| Street Address: <u>4300 Cherry Creek Dr. South</u> | | | Street Address: <u>/</u> | | |
| City: <u>Denver</u> | | | City: <u>/</u> | | |
| State: <u>CO</u> | Zip Code: <u>80222</u> | Telephone: <u>(303) 692-3394</u> | State: <u>/</u> | Zip Code: <u>/</u> | Telephone: <u>()</u> |
| Type of Ownership: <input type="checkbox"/> Private <input type="checkbox"/> Federal Agency <input checked="" type="checkbox"/> State <input type="checkbox"/> Indian | | | How (usually) Identified: <input type="checkbox"/> Census Censuses <input type="checkbox"/> PA Petition <input checked="" type="checkbox"/> State/Local Program <input type="checkbox"/> RCRA CERCLA Notification | | |
| <input type="checkbox"/> County <input type="checkbox"/> Municipal <input type="checkbox"/> Not Specified <input type="checkbox"/> Other _____ | | | <input type="checkbox"/> Federal Program <input type="checkbox"/> Incidental <input type="checkbox"/> Not Specified <input type="checkbox"/> Other _____ | | |

3. Site Evaluator Information

| | | |
|---|--|--|
| Name of Evaluator: <u>Rachel Badger</u> | Agency/Organization: <u>URS Operating Services</u> | Date Prepared: <u>2/96</u> |
| Street Address: <u>1099 18th St., Ste 710</u> | | City: <u>Denver</u> State: <u>CO</u> |
| Name of EPA or State Agency Contact: <u>Pat Smith</u> | | Street Address: <u>999 18th Street</u> |
| City: <u>Denver</u> | State: <u>CO</u> | Telephone: <u>(303) 32-7221</u> |

4. Site Disposition (for EPA use only)

| | | |
|--|--|--|
| Emergency Response/Removal Assessment Recommendation: <input type="checkbox"/> Yes <input type="checkbox"/> No Date: _____ | CERCLIS Recommendation: <input type="checkbox"/> Higher Priority SI <input type="checkbox"/> Lower Priority SI <input type="checkbox"/> NFRAP <input type="checkbox"/> RCRA <input type="checkbox"/> Other _____ Date: _____ | Signature: _____ Name (print): _____ Position: _____ |
|--|--|--|



Potential Hazardous Waste Site
Preliminary Assessment Form - Page 2 of 4

CERCLIS Number:

CO 0401399633

5. General Site Characteristics

Predominant Land Uses Within 1 Mile of Site (check all that apply):

- | | | |
|---|---|---|
| <input type="checkbox"/> Industrial | <input type="checkbox"/> Agriculture | <input type="checkbox"/> DOI |
| <input checked="" type="checkbox"/> Commercial | <input type="checkbox"/> Mining | <input type="checkbox"/> Other Federal Facility |
| <input checked="" type="checkbox"/> Residential | <input type="checkbox"/> DOD | |
| <input type="checkbox"/> Forest/Fields | <input checked="" type="checkbox"/> DOE | <input type="checkbox"/> Other _____ |
| | (UMTRA) | |

Site Setting:

- ☐ Urban
☐ Suburban
☒ Rural

Years of Operation:

Beginning Year 1932
Ending Year 1935
☐ Unknown

Type of Site Operations (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> Manufacturing (must check subcategory) <ul style="list-style-type: none"><input type="checkbox"/> Lumber and Wood Products<input type="checkbox"/> Inorganic Chemicals<input type="checkbox"/> Plastic and/or Rubber Products<input type="checkbox"/> Paints, Varnishes<input type="checkbox"/> Industrial Organic Chemicals<input type="checkbox"/> Agricultural Chemicals (e.g., pesticides, fertilizers)<input type="checkbox"/> Miscellaneous Chemical Products (e.g., adhesives, explosives, ink)<input type="checkbox"/> Primary Metals<input type="checkbox"/> Metal Coating, Plating, Engraving<input type="checkbox"/> Metal Forging, Stamping<input type="checkbox"/> Fabricated Structural Metal Products<input type="checkbox"/> Electronic Equipment<input type="checkbox"/> Other Manufacturing | <input type="checkbox"/> Retail <ul style="list-style-type: none"><input type="checkbox"/> Recycling<input type="checkbox"/> Junk/Salvage Yard<input type="checkbox"/> Municipal Landfill<input type="checkbox"/> Other Landfill<input type="checkbox"/> DOD<input type="checkbox"/> DOE<input type="checkbox"/> DOI<input type="checkbox"/> Other Federal Facility _____<input type="checkbox"/> RCRA<ul style="list-style-type: none"><input type="checkbox"/> Treatment, Storage, or Disposal<input type="checkbox"/> Large Quantity Generator<input type="checkbox"/> Small Quantity Generator<input type="checkbox"/> Subtitle D<ul style="list-style-type: none"><input type="checkbox"/> Municipal<input type="checkbox"/> Industrial<input type="checkbox"/> "Converter"<input type="checkbox"/> "Protective Filter"<input type="checkbox"/> "Non- or Late Filter"<input type="checkbox"/> Not Specified |
| <input type="checkbox"/> Mining <ul style="list-style-type: none"><input type="checkbox"/> Metals<input type="checkbox"/> Coal<input type="checkbox"/> Oil and Gas<input type="checkbox"/> Non-metallic Minerals | <input checked="" type="checkbox"/> Other <u>Lead Smelter</u> |

Waste Generated:

- ☒ Onsite
☐ Offsite
☐ Onsite and Offsite

Waste Deposition Authorized By:

- ☐ Present Owner
☒ Former Owner
☐ Present & Former Owner
☐ Unauthorized
☐ Unknown

Waste Accessible to the Public:

- ☐ Yes
☒ No

Distance to Nearest Dwelling, School, or Workplace:

1,320 Feet

6. Waste Characteristics Information

Source Type:
(check all that apply)

- ☐ Landfill
☐ Surface Impoundment
☐ Drums
☐ Tanks and Non-Drum Containers
☐ Chemical Waste Pile
☐ Scrap Metal or Junk Pile
☐ Tailings Pile
☐ Trash Pile (open dump)
☐ Land Treatment
☐ Contaminated Ground Water Plume (unidentified source)
☐ Contaminated Surface Water/Sediment (unidentified source)
☐ Contaminated Soil
☒ Other SLAG PILE
☐ No Sources

Source Waste Quantity:
(include units)

200,000 cu.yds.

Tier *

General Types of Waste (check all that apply)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Metals | <input type="checkbox"/> Pesticides/Herbicides |
| <input type="checkbox"/> Organics | <input type="checkbox"/> Acids/Bases |
| <input checked="" type="checkbox"/> Inorganics | <input type="checkbox"/> Oily Waste |
| <input type="checkbox"/> Solvents | <input type="checkbox"/> Municipal Waste |
| <input type="checkbox"/> Paints/Pigments | <input type="checkbox"/> Mining Waste |
| <input type="checkbox"/> Laboratory/Hospital Waste | <input type="checkbox"/> Explosives |
| <input type="checkbox"/> Radioactive Waste | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Construction/Demolition Waste | |

Physical State of Waste as Deposited (check all that apply):

- ☒ Solid ☐ Sludge ☐ Powder
☐ Liquid ☐ Gas

* C = Constituent, W = Waste stream, V = Volume, A = Area

APPENDIX B

PA Worksheet

PA WORKSHEET

Site Name Durango Lead Smelter City, State Durango, Colorado

CERCLIS ID # CO0001399633

Reported by Rachel Badger Date March 1996

HIGHLIGHTS:

- A) IS THERE QUALITATIVE OR QUANTITATIVE EVIDENCE OF A RELEASE TO AIR, SURFACE WATER, GROUNDWATER, OR SURFACE SOIL? DESCRIBE BRIEFLY.
More detail in items GW-1 (for groundwater pathway), SW-5 (for surface water pathway), A-1 (for air pathway), and SE-1 (for soil exposure pathway).

DOE UMTRA and Bureau of Reclamation data supplied as a part of the PA Report provide groundwater, surface water, sediment, and slag material data.

- B) IS THERE EVIDENCE OF AN IMPACTED TARGET POPULATION? DESCRIBE.

| Pathway | Target | None/target Size | Brief Description | More Discussion In |
|---------------|--------------------------------|------------------|-------------------|--------------------|
| Groundwater | Public drinking Water supply | 0 | N/A | N/A |
| | Domestic drinking Water supply | 0 | N/A | N/A |
| Surface Water | Drinking water | 0 | N/A | N/A |
| | Fishery | 0 | N/A | N/A |
| | Sens. env. | 0 | N/A | N/A |
| Soil Exposure | People within 200' | 0 | N/A | N/A |
| | Terrestrial sens. env. | 0 | N/A | N/A |
| Air | Population | 0 | N/A | N/A |

SITE INFORMATION

G-1. Directions to the site (from nearest easily recognized point).

Entering from the south, continue into Durango on Highway 160 until it turns into Camino del Rio. The site is located southwest of the intersection of Highways 550 and 160 along the west bank of the Animas River.

G-2. Are there other potential sources in the neighborhood to be aware of as the site is evaluated? eg. Is the site in an industrial area, near a railroad, along a highway? Are sources with similar contaminants to this site in the vicinity?

The site is located approximately three-quarters of a mile north of a former copper smelter site. (Cerclis ID # CO0001399633).

Source of information: Smith 1980; UOS 1996

Background/Operating History

G-3. Describe the operating history of the site:

The Durango Lead Smelter site operated from approximately 1882 through 1935. The site operated under various names, closing in the mid-1930s under the name of the American Smelting and Refining Company.

Source of information: Jacobs 1995; Smith 1980

G-4. Describe site and nature of operations (property size, manufacturing, waste disposal, storage etc.):

This site is the location of a former lead smelter operation. The slag in the area was a by-product of the smelting process and was deposited along the west bank of the Animas River. The slag is presumed to encompass approximately 15 acres.

Source of information: Jacobs 1995; UOS 1996

G-5. Describe any emergency or remedial actions that have occurred at the site:

A Uranium Mill Tailings Remedial Action (UMTRA) was conducted by the U.S. Department of Energy in the 1980s to clean up uranium mill tailings located at the site. The tailings were deposited by a former uranium mill that operated at the location of the former smelter site after the smelter closed.

Source of information: DOE 1995

G-6. Are there records or knowledge of accidents or spills involving site wastes? Are there Emergency Response Notification (ERNs) reports for this location?

No.

Source of information: N/A

G-7. Describe existing sampling data and briefly summarize data quality (e.g., sample objective, age/comparability, analytical methods, detection limits, QA/QC, validity):

Refer to PA Report.

Source of information: N/A

G-8. Is there any other local, state or federal regulatory involvement? Describe. Include permits, and names of contact individuals within each government organization. No.

| AGENCY | PROGRAM | CONTACT | PHONE | PERMIT |
|--------|---|--------------------------------------|----------------|---|
| DOE | UMTRA | Donald R. Metzler, Hydrogeologist | (505) 845-5657 | The remedial action related to former uranium mill tailings at the same site location, not lead smelter slag. |
| BOR | Durango Pumping Plant Animas La-Plata Project | Tom Strain, Geologist | (970) 385-6532 | BOR plans to build a pumping plant 3,000 ft. south of the site location. |

G-9. Attach site sketch or schematic. Include all pertinent features including wells, storage areas, underground storage tanks, source areas, buildings, access roads, areas of ponded water. Refer to figure(s) submitted with text of report if appropriate.

Refer to Figure 2, Site Location Map, PA Report.

SOURCE CHARACTERIZATION

WC-1. Describe each source at the site, on Table 1, in terms of source type, containment, size/area/volume/quantity, and substances present. See HRS Tables 2-5 and 5-2 for source descriptions, Tables 3-2, 4-2, 4-8, 5-6, 6-3, and 6-9 for containment.

WC-2. Briefly describe how waste quantity was estimated (e.g., historical records or manifests, permit applications, air photo measurements, etc.):

Waste quantity was estimated by the Department of Energy(DOE)/Colorado Department of Public Health and the Environment (CDPHE) during UMTRA-related activities at the site. The quantity of wastes is estimated to be approximately 200,000 cubic yards.

Source of information: CDPHE 1996

WC-3. Describe any restrictions or barriers to accessibility of on-site sources.

Locking gates are located at the two entrances to the site (north and south entrances). The site is bounded by the Animas River to the west and Smelter Mountain to the east.

Source of information: UOS 1996

GROUNDWATER CHARACTERISTICS

GW-1. Any positive or circumstantial evidence of a release to groundwater? Describe.

Refer to PA Report.

Source of information: N/A

GW-2. Any positive or circumstantial evidence of a release to drinking water users? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

No.

Source of information: N/A

GW-3. Briefly describe the geologic setting.

Refer to PA Report.

GW-4. Describe geologic/hydrogeologic units on Table 2. Give names, descriptions, and characteristics of consolidated and unconsolidated zones beneath the site.

GW-5. Is the site in an area of karst terrain or a karst aquifer?

No.

GW-6. Net Precipitation (per HRS section 3.1.2.2).

1.61 inches

SURFACE WATER CHARACTERISTICS

SW-1. Mean annual precipitation (per HRS section 4.0.2)= 12.83". If less than 20", then count intermittent channels as surface water.

SW-2. Discuss the probable surface water flow pattern from the site to surface waters:

The site is located along the west bank of the Animas River.

Source of information: UOS 1996

SW-3. If surface water exists within 2 miles of the site, describe surface water segments within the 15-mile distance limit.

| Segment Name | River/Lake/Type | Fresh/Salt Water | Start (mi.) | End (mi.) | Flow In cfs |
|--------------|-----------------|------------------|-------------|-----------|-------------|
| Animas River | River | Fresh | 0 | 15 | 822 |

Groundwater to surface water distance - Angle Θ -

SW-4. Provide a schematic diagram or simple figure which describes surface water segments, locates targets, identifies flow direction, PPE(s), etc. Refer to figure(s) submitted with text of report if appropriate.

Refer to Figure 1, Area of Influence Map, PA Report.

SW-5. Any positive or circumstantial evidence of a release to surface water? Evidence of a release by direct observation? Is the source located in surface water? Describe.

Slag was observed to be sloughing into the Animas River from its location along the west bank.

Source of information: UOS 1996

SW-6. Any positive or circumstantial evidence of a release to surface water target populations? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

Refer to PA Report.

Source of information: N/A

SW-8. Is the site or portions thereof located in surface water?

Is the site located in the 1 - <10 yr floodplain?

>10-100 yr?

>100-500 yr?

>500 yr?

SW-9. Two-year 24-hour rainfall 1.5 inches

75-60201.00

\\START\\Durango\\Final-Pb.PA\\Rev-1\\Worksheet:bas:jmb

TARGETS

T-1. Discuss groundwater usage within four miles of the site:

The DOE has documented 20 domestic groundwater wells within a two mile radius of the site. Groundwater well logs from the State Engineer's Office indicate permits issued for 90 private wells within a two to three mile radius of the site. Drinking water is obtained from surface water supplies for the city of Durango.

Source of information: State Engineer's Office 1996.

T-2. Summarize the drinking water* population served via groundwater within four miles of the site:

| | |
|--------------|------------|
| 0 - 1/4 mi | <u>≈8</u> |
| 1/4 - 1/2 mi | <u>≈8</u> |
| 1/2 - 1 mi | <u>≈8</u> |
| 1 - 2 mi | <u>≈24</u> |
| 2 - 3 mi | <u>21</u> |
| 3 - 4 mi | <u>190</u> |

Attach calculations for population apportionment in blended systems.

*Drinking water for the city of Durango is obtained from the Florida and Animas Rivers.

T-3. Identify and locate any of the following surface water targets within 15 miles of the site: drinking water population(s) served by intakes, fisheries, sensitive environments described in Table 4-23 of the HRS, and wetlands as defined in the Federal Register.

| Targets | Dist. From Site | SW Body | Flow In cfs | Population Served/Size (Incl. Units) | Contamination Known/Suspected |
|----------|-----------------|--------------|-------------|--------------------------------------|--|
| Fishery | 0 - 15 | Animas River | 822 | N/A | Suspected - refer to DOE data, Table 3 and 4 |
| Wetlands | 0 - 15 | Animas River | 822 | N/A | Suspected - refer to DOE data, Table 3 and 4 |

T-4. Summarize the population within a four-mile radius of the site:

| | <u>Total Pop.</u> | <u>Worker Pop.</u> |
|--------------|-------------------|--------------------|
| on site | <u>0</u> | <u>0</u> |
| 0 - 1/4 mi | <u>1,036</u> | |
| 1/4 - 1/2 mi | <u>1,036</u> | |
| 1/2 - 1 mi | <u>2,071</u> | |
| 1 - 2 mi | <u>4,143</u> | |
| 2 - 3 mi | <u>4,143</u> | |
| 3 - 4 mi | <u>0</u> | |

T-5. Identify and locate any terrestrial sensitive environments described in Table 5-5 of the HRS.

Terrestrial critical habitat for the Mexican Spotted Owl (federally-listed threatened) occurs in La Plata County. Terrestrial habitat known or suspected to be used by the following federally-listed threatened (T) or endangered (E) species in La Plata County: Peregrine Falcon (E), Bald Eagle (T), Eskimo Curlew (E), Southwestern Willow Flycatcher (E), Black-footed Ferret (E), and Knowlton's Cactus (E).

T-6. Describe any positive or circumstantial evidence of a release to air target populations? Of a release by direct observation where target population exists within 1/4 mile of the site? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

None.

T-7. Identify and locate any potential or known resident soil exposure populations, if present. Describe conditions which led the researcher to suspect contaminated soil within 200' of residences, if this condition exists.

The Black-footed Ferret (federally-listed endangered), and Knowlton's Cactus (federally-listed endangered) are present in La Plata County or the County is in species' historical range. The nearest residences (approximately five houses) are located approximately one-quarter of a mile to the east of the site (on the east side of the Animas River).

TABLE 1
WASTE CONTAINMENT AND HAZARDOUS SUBSTANCE IDENTIFICATION¹

| SOURCE TYPE | SIZE (Volume/Area) | ESTIMATED WASTE QUANTITY | SPECIFIC COMPOUNDS | CONTAINMENT ² | SOURCES OF INFORMATION |
|---------------------------|--|-----------------------------|-----------------------------------|--|---------------------------------|
| Lead Smelter Slag Pile | ≈ 15 acres or 653,400 ft ² | ≈ 200,000 yd ³ | Refer to DOE data and BOR data | Covered with 18 to 24 inches of clean backfill and ≈ 6 inches of topsoil. Unlined. | CDPHE 1996. Jacobs 1995. |

¹ Use additional sheets if necessary.

² Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - non-existent, natural or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.)

TABLE 2
HYDROGEOLOGIC INFORMATION¹

| STRATA NAME/DESCRIPTION | THICKNESS (ft.) | HYDRAULIC CONDUCTIVITY (cm/sec) | TYPE OF DISCONTINUITY ² | SOURCE OF INFORMATION |
|----------------------------|-----------------|------------------------------------|---------------------------------------|---|
| Alluvium | 15 feet | 7×10^{-3} cm/sec | N/A | Jacobs 1995. Office of the Federal Register 1990. |
| Colluvium | 25 feet | 10^{-4} cm/sec | N/A | Jacobs 1995. Office of the Federal Register 1990. |
| Mancos Shale | 1,700 feet | 10^{-6} cm/sec | N/A | Jacobs 1995. Office of the Federal Register 1990. |

¹ Use additional sheets if necessary.

² Identify the type of aquifer discontinuity within four-miles from the site (e.g., river, strata "pinches out," etc.).

APPENDIX C

CERCLA Eligibility Worksheet

CERCLA Eligibility Worksheet

Site Name Durango Lead Smelter

City Durango State Colorado

EPA ID Number CO0001399633

Note: The site is automatically CERCLA eligible if it is a Federally owned or operated RCRA site.

I. CERCLA Eligibility

Did the facility cease operations prior to November 19, 1980?

Yes

If YES, then STOP. The facility is probably a CERCLA site.

If NO, continue to part II

II. RCRA Deferral Factors

Did the facility file a RCRA Part A application?

If YES:

1. Does the facility currently have interim status?
2. Did the facility withdraw its Part A application?
3. Is the facility a known or possible protective filer? (filed in error)
4. Does the facility have a RCRA operating or post closure permit?
5. Is the facility a late (after 11/19/80) or non-filer that has been identified by the EPA or the State? (facility did not know it needed to file under RCRA)

Type of facility:

Generator Transporter Recycler
TSD (Treatment/Storage/Disposal)

If all answers to questions 1, 2, and 3 are NO, STOP. The facility is a CERCLA eligible site.

If answer to #2 or #3 is YES, STOP. The facility is a CERCLA eligible site.

If answer to #2 and #3 are NO and any other answer is YES, site is RCRA, continue to part III.

III. RCRA Sites Eligible for the NPL

75-60201.00

\\START\\Durango\\Final-Pb.PA\\Rev-1\\CERCLA\\bas

Has the facility owner filed for bankruptcy under Federal or State laws? _____

Has the facility lost RCRA authorization to operate or shown probable unwillingness to carry out corrective action? _____

Is the facility a TSD that converted to a generator, transporter or recycler facility after November 19, 1980? _____

IV. Exempted substances:

Does the release involve hazardous substances other than petroleum? _____

V. Other programs: The site may never reach the NPL or be a candidate for removal. We need to be able to refer it to any other programs in EPA or state agencies which may have jurisdiction, and thus be able to effect a cleanup. Responses should summarize available information pertaining to the question. Include information in existing files in these programs as part of the PA. Answer all that apply.

Is there an owner or operator?

NPDES-CWA: Is there a discharge water containing pollutants with surface water through a point source (pipe, ditch, channel, conduit, etc.)?

CWA (404): Have fill or dredged material been deposited in a wetland or on the banks of a stream? Is there evidence of heavy equipment operating in ponds, streams or wetlands?

UIC-SDWA: Are fluids being disposed of to the subsurface through a well, cesspool, septic system, pit, etc.?

TSCA: Is it suspected that there are PCB's on the site which came from a source with greater than 50 ppm PCB's such as oil from electrical transformers or capacitors?

FIFRA: Is there a suspected release of pesticides from a pesticide storage site? Are there pesticide containers on site?

RCRA (D): Is there an owner or operator who is obligated to manage solid waste storage or disposal units under State solid waste or ground water protection regulations?

UST: Is it suspected that there is a leaking underground storage tank containing a product which is a hazardous substance or petroleum?

APPENDIX D

Site Reconnaissance Form

**PRELIMINARY ASSESSMENT
SITE RECONNAISSANCE FORM**

Site: Durango Lead Smelter - TDD #9602.0001

Address: Located southwest of the intersection of Routes 550 and 160.

Date: February 21, 1996

SAM/OSC: Pat Smith Tel: 312-6082

Investigators: Rachel Badger and Mark Rudolph

Site Contact: Tom Strain, Bureau of Reclamation/Durango and Wendy Naugle, CDPHE/Denver

Weather (include wind direction and speed) About 40°F., overcast, no wind or rain.

General Site Conditions (include site structures, pavement, activities, operations etc.) The site has been graded (under UMTRA activities), covered with backfill and topsoil, and vegetated. Vegetation appeared to be establishing growth; however, site visit conducted outside growing season. Slag material was observed all along the west bank of the Animas River. There were at least two large exposed areas where slag outcropped on the west banks. Brick, concrete, and metal debris were observed at locations along the west bank of the river.

CRITICAL TARGET AND PATHWAY INFORMATION

(reference to photographs or logbook if appropriate)

Site Access (fences, gates, etc.): Locking gates.

Odors or smoke: None observed.

Water or soil staining: Slag was exposed at some locations along the river banks.

Stressed Vegetation: None observed.

Overland Flow/Surface Water Runoff: Site is located on west bank of Animas River. Slag was observed to be sloughing into the river.

Fishing Activity: Known fishery.

On-site Recreational Activities: Kayak course on Animas River adjacent to slag location.

Nearest public use/recreational area: Gateway Park across from slag location on the east bank of the Animas River.

Nearest residence (include address): Approximately five houses located at 3rd Street and 3rd Avenue approximately 1/4 mile east of the site.

Evidence that children use site: None.

Wells (include address of nearest well): Monitoring wells located on site. No residential wells located.

Endangered or threatened species: None observed.

Do any site conditions pose an immediate threat to nearby population or the environment?

NO ☒ YES ☐ (if yes, please notify the TM/OSC immediately)

Signature of investigator: _____ Date _____

APPENDIX E

Site Photolog

Color Photo(s)

The following pages
contain color that does
not appear in the
scanned images.

To view the actual images, please
contact the Superfund Records
Center at (303) 312-6473.



PHOTO 1

Photo of the west bank of the Animas River showing slag chunks, foundation material, and metal debris intermixed with riprap material.

PHOTO 2

Photo taken of foundation material (with metal beam) found along the west bank of the Animas River.

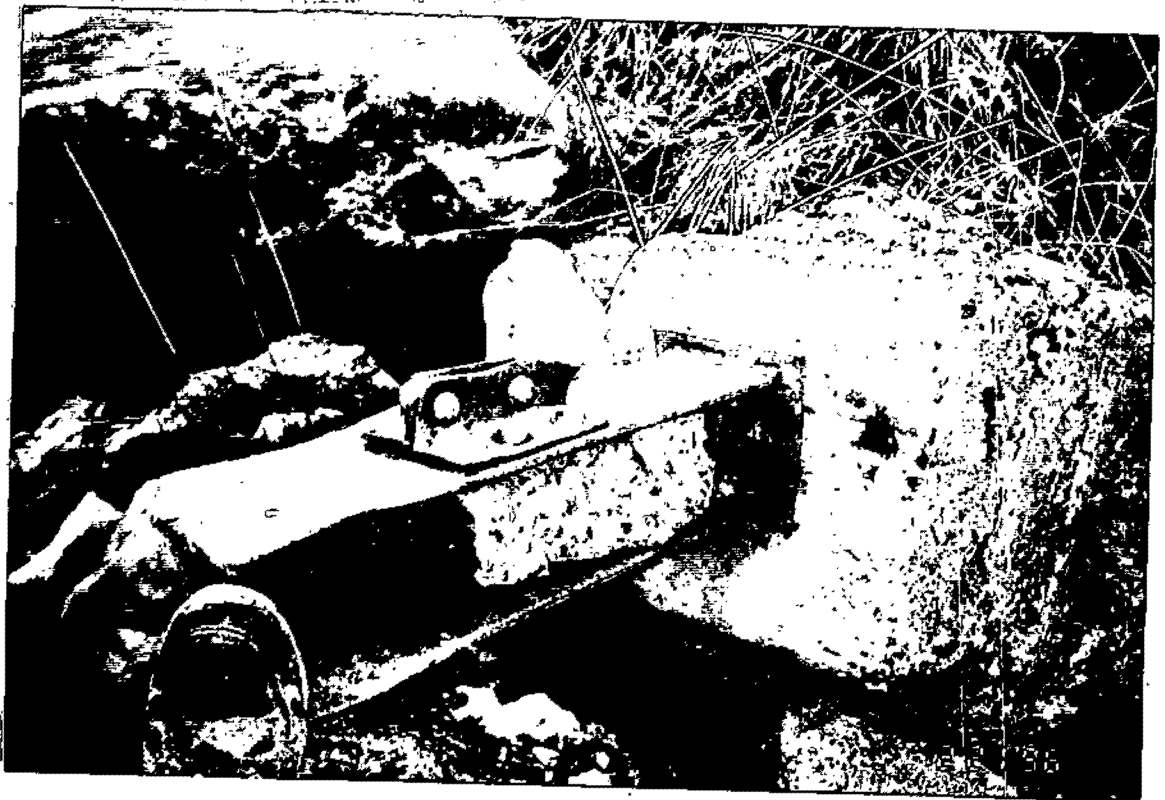




PHOTO 3

Photo (facing south) of the west bank of the Animas River. Shows outcrop of slag material where slag was buried and the area was vegetated.

PHOTO 4

View to the south of the west bank of the Animas River. Note slag material sloughing into the river.





PHOTO 5

Photo of the eroding bank (facing west). Note slag chunks embedded in the bank near the high water mark.



PHOTO 6

View facing west of a drainage channel to the Animas River. Slag outcroppings line the channel.



PHOTO 7

Taken to the southwest, this photo shows the Animas River Special Fishing Regulations posting with the river in the background. Note the slag outcropping in the left frame.

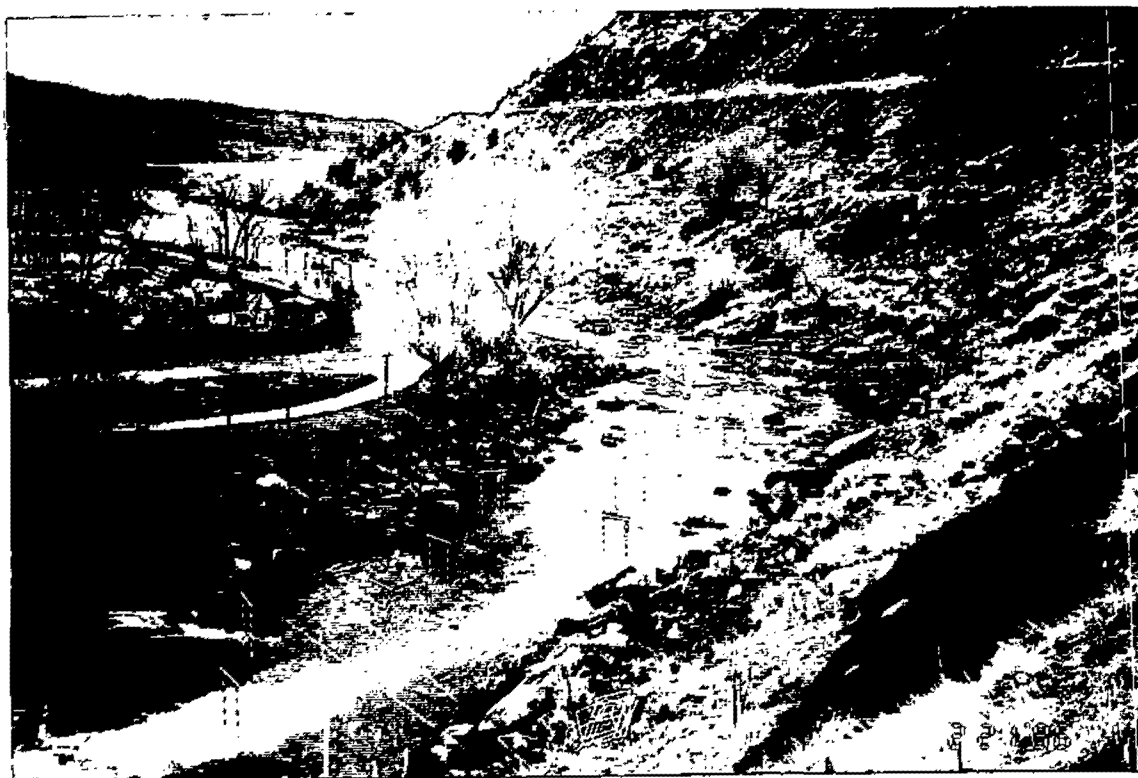


PHOTO 8

Photo taken facing southeast from the west bank showing a recreational kayak course on the Animas River. Note slag outcropping on the west bank.